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THE HOME SATELLITE TELEVISION MAGAZINE™

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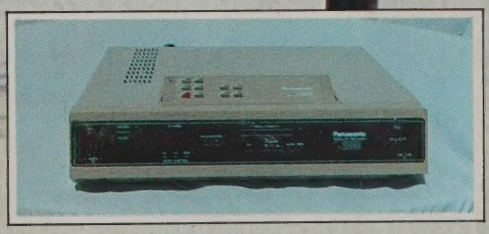

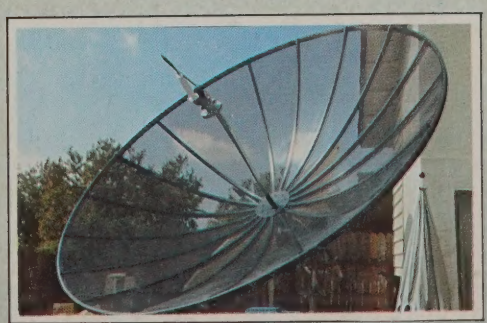

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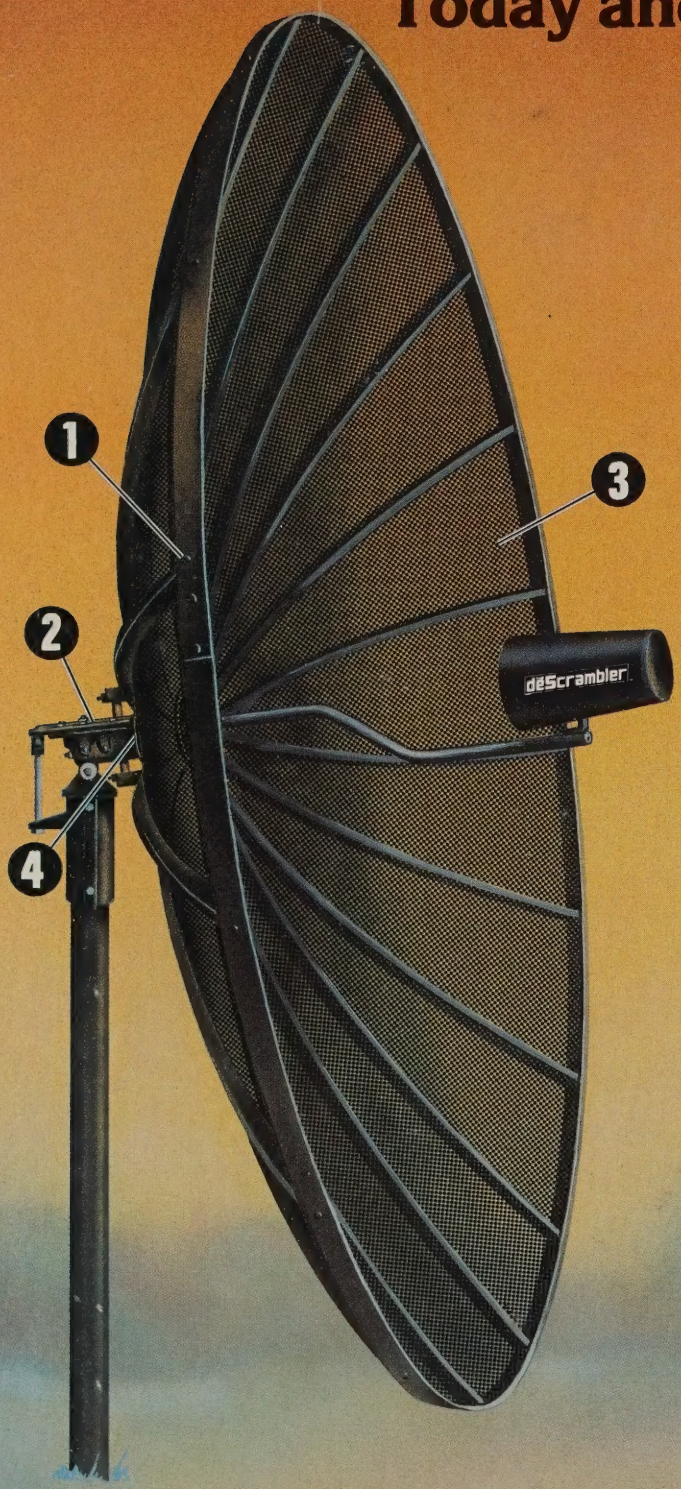

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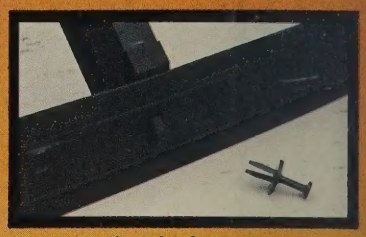

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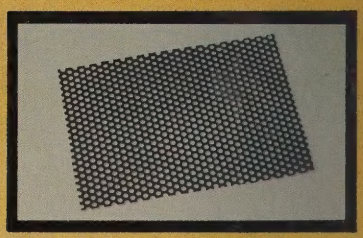

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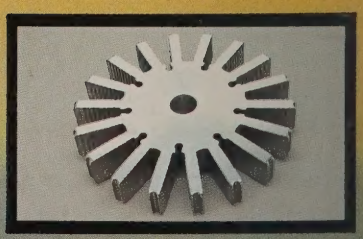

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"I highly recommend . . ." *Richard Sinervo, Satellite Opportunities Magazine, April 1985*

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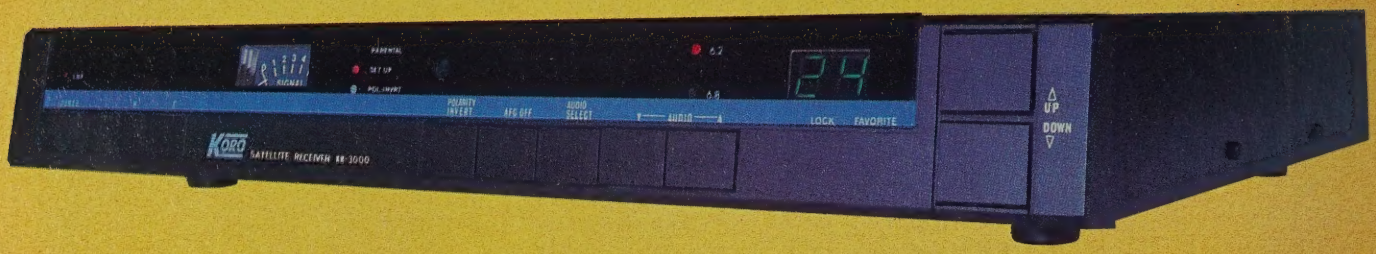

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About our cover: Santa's gone but Jack Frost will linger with us for some time. As you bundle up for the cold weather, we at **STV®** wish you happiness in the New Year as you enjoy the abundance of programming provided by your TVRO system. Photo by Steve Tooney. (December 1985 **STV** cover photo also by Steve Tooney.)

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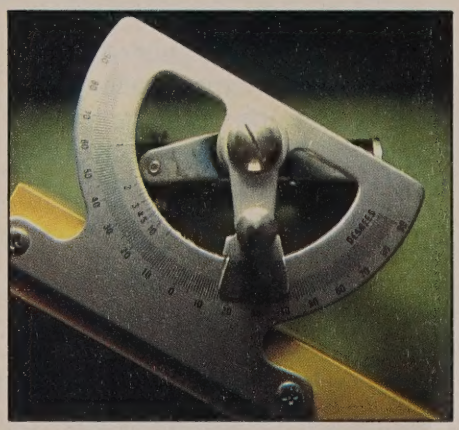

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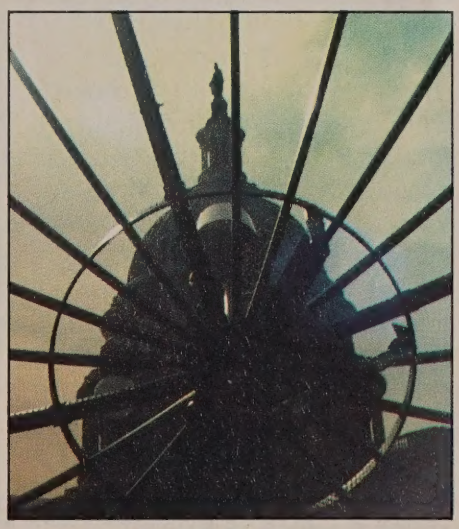

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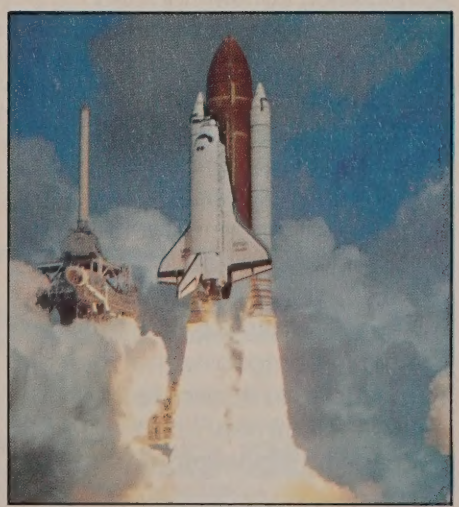

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Editor's Corner

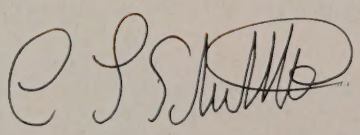
by Christopher J. Schultheiss

The Year In Review

1985 has been a year of ups and downs for home satellite TV viewers. The ups were primarily in the design and performance of the components. Highly efficient antennas, sophisticated microprocessor controlled receivers, and low cost, low noise amplifiers came together to produce cheaper, better performing, and easier-to-use home satellite systems. Antennas in the four to six foot range established a foothold in the market finding favor with apartment and condominium dwellers who, for obvious reasons, were unable to install eight to ten foot systems. Small antenna systems accounted for three to four percent of the 550,000 systems sold in 1985.

The total systems sold fell substantially short of the 750,000 projected by many manufacturers primarily because of uncertainty caused by the threat of scrambling. In the spring of the year the major cable companies convened at the National Cable Television Association convention and announced that they would no longer support cable programmers who did not plan to scramble their services stating that "they did not intend to pay for services which home satellite viewers received for free." This pronouncement unleashed a floodgate of programmers who were tripping over each other in a rush to assure the cable companies that they did indeed plan to scramble their services in the near future. In quick succession a dozen programmers announced firm scrambling plans with special rates to home satellite viewers. Some of these special rates ranged as high as 1,000 percent over the rate charged to cable operators and the home satellite industry responded with outrage. SPACE responded quickly by introducing two bills in Congress and one in the Senate in an attempt to head off what was perceived as an attempt to put the home satellite industry out of business. Cable companies responded with a well orchestrated media campaign painting home satellite viewers as pirates and warning that "the skies are going to turn dark." The scare tactics worked—consumers reacted with confusion and delayed plans to purchase home satellite systems. Sales fell 30 percent behind projections and manufacturers, distributors, and dealers felt the crunch. An oversupply of products caused price cutting and with reduced profits businesses without good financial reserves fell by the wayside. The consumers who did buy systems wisely benefited from the reduced prices. Nineteen eighty-five has been a very unsettled year for the home satellite TV industry, and the first half of 1986 may not be much better.

Happy New Year!



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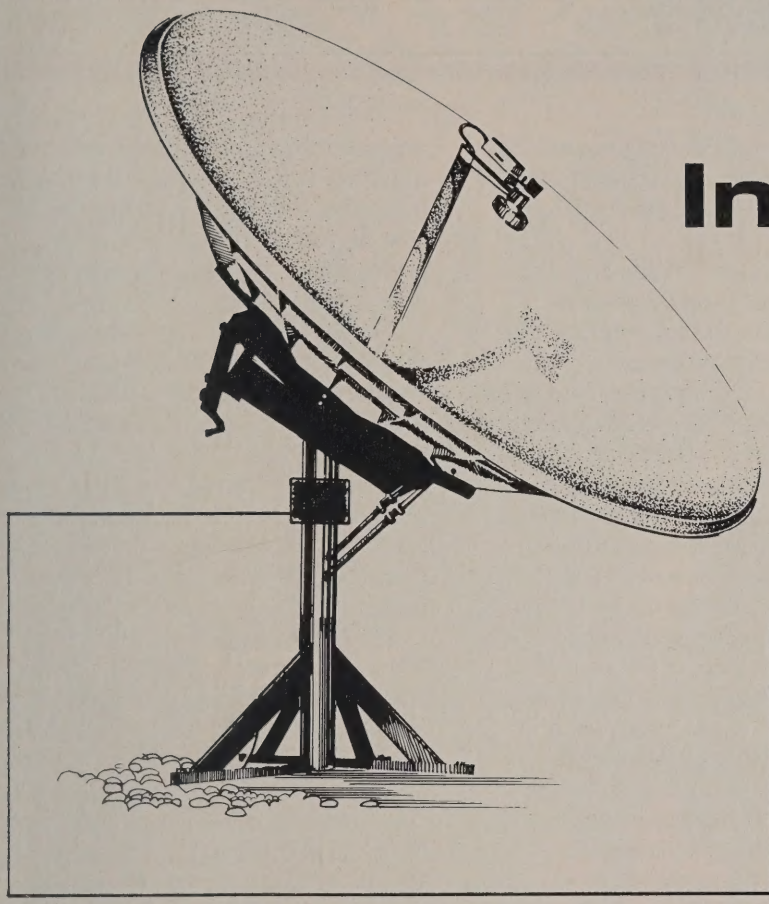

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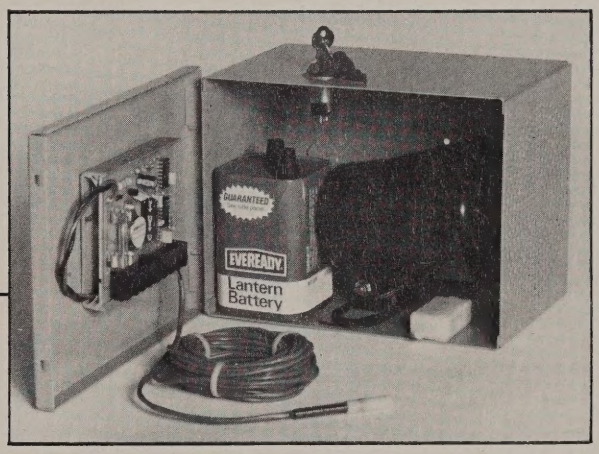

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The Canadian Scene

by Bill Barr

I was recently involved in a situation that I would like to share with you. It is relevant to what can happen to any dealer in the satellite business.

In 1982, in a very small town, a dealer sold a satellite system to a local high-profile businessman. The system consisted of an 11 foot ADM antenna, a 100 degree LNA, and a Drake ESR 24 receiver. The polarization was done by an Alliance antenna rotor which ADM supplied along with the antenna. The antenna drive was by Lawhorn and the positioner consisted of a pot driving a milli-amp meter which indicated the position of the antenna.

This system was state-of-the-art in early 1982. Though some people may laugh at the antenna rotor polarizer, thousands of systems were installed using this device until the folks at Chaparral Communications introduced us to the Polarotor™. This system initially delivered excellent pictures on all transponders. The problem some consumers found with this type of system was understanding what actually happened when you moved the rotor to polarize. In addition, the satellite belt, which is invisible, requires the customer to think of satellite positions in terms of degrees when reading the programming guide.

I spent many hours teaching consumers to comprehend the discipline required to get a clear picture on all the satellites with this type of system. Sadly, some consumers never got the hang of it; in some cases, a young person in the family saved the day. They taught their parents, over many months, to use the system effectively.

With the system in question, the owner was not satisfied with the equipment due to its complication as well as its technical problems. After the system was 12 months old I was asked to visit the site and to make suggestions.

The drive in the blinding snowstorm took me eight hours. After surveying the equipment, I determined that the RG213 cable connecting the LNA to the downconverter was excessive in length. The 100 foot run to the house was eating up 17 dB of signal at 4 GHz and starving the downconverter. In defense of the dealer, let me say that I had instructed him to always install the downconverter in a stable temperature environment to prevent channel drifting and water penetration. The problem was that the dealer carried out my instructions perfectly but the cable length was excessive. For some mysterious reason the electronics performed with the long cable when it was new, but performance deteriorated as the cable aged.

I spent many hours teaching consumers to comprehend the discipline required to get a clear picture on all the satellites with this type of system. Sadly, some consumers never got the hang of it; in some cases, a young person in the family saved the day. They taught their parents, over many months, to use the system effectively.

To correct the situation, we installed the downconverter outside at the antenna and ran the 70 MHz signal indoors to the receiver. The pictures were impeccable. The Drake ESR 24 was doing justice to the excellent signal collected from the ADM. I was able to polarize the system and skip satellites with ease.

I noticed when the owner exercised the unit he was unable to null out the adjacent polarization or go in the correct direction to a desired satellite and peak the signal strength. I gave him my once over and left for home confident that, with practice, the owner would soon master the system.

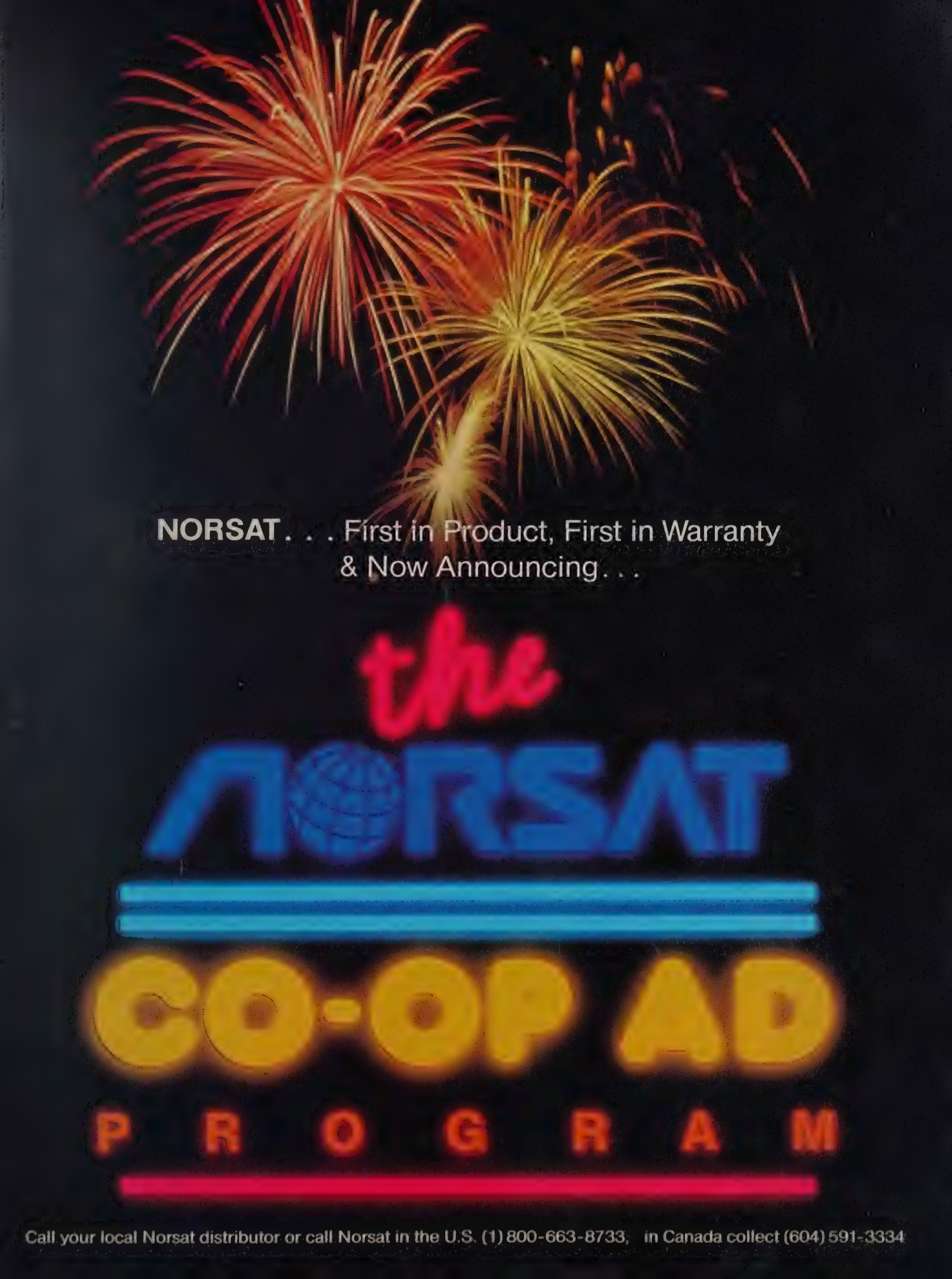
I never heard from the dealer about this consumer again and was convinced that we had another satisfied customer. Around mid-October, some three years later, I was asked to testify in a court action brought against the dealer. The case contended that this customer had recently purchased a Channel Master system and was convinced that he was ripped off with the initial purchase.

As most of you know, the Channel Master system consists of one of the most powerful microprocessor driven satellite systems on the market today. It can be programmed to stop on up to 30 satellites, store polarization and audio subcarriers, and even skew position. Coupled with this was the Channel Master 10 foot compression molded antenna—one of the best available. The proud new owner of this system had no problem pushing the buttons, and this only reinforced his conviction that he had been gypped in his original purchase, to the tune of $7500 Canadian.

The court was asked to rule that the dealer should return the $7500 with interest. The case presented by the plaintiff's lawyer was very convincing. The consensus at that point was in favor of the consumer.

It proved difficult to convince the judge that this dealer and consumer were caught in a technology squeeze. Equipment was improving in quantum leaps, distributors had three or four revisions of the same equipment in stock and had difficulty moving out the older models. In a very short time frame, the industry was introduced to polarizers; manually driven first, then automatically receiver driven, digital transponder indication, digital position indication, stereo decoders, programmable actuators, format

See **Canadian Scene** on page 84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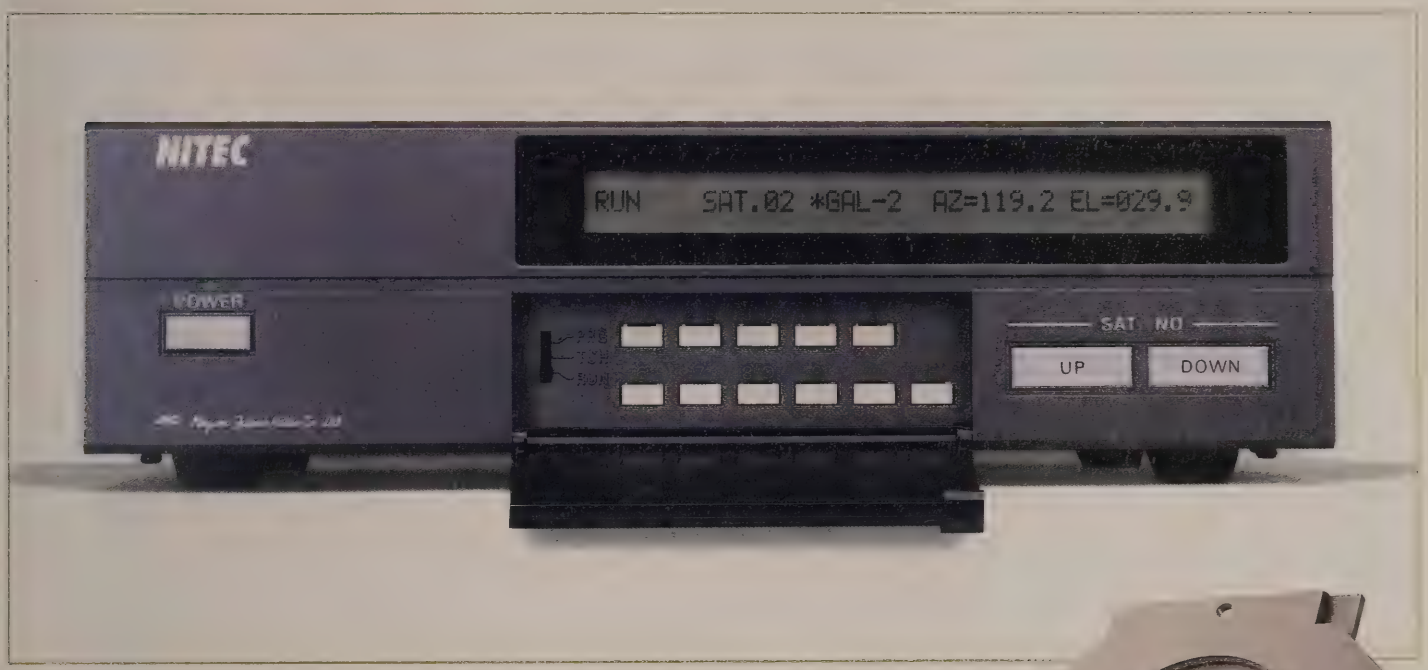

When a new product is introduced most people just naturally expect that it'll need a lot of time to prove itself. And some people are reluctant to take any product seriously unless it's "been around" awhile.

At NITEC Advanced Technologies we've engineered a home satellite antenna positioner that's bound to change a lot of the tried-and-true expectations. Our Robot Antenna Positioner isn't just new — it's a challenge toward a whole new technological era for the TVRO industry.

We've teamed a computer with a robot for the ultimate accuracy in satellite tracking. The computer (or Satellite Selector) is pre-programmed with azimuth and elevation data for the 16 existing broadcast satellites (and capable of storing the coordinates for 16 more). The user selects a desired satellite by pushing a button on the computer. The selector calculates the appropriate directional angles from the latitude and longitude of the earth station, and signals the robot to position the antenna.

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But even with all this emphasis on precision, the Robot Antenna Positioner's components aren't lightweights by any means. The Satellite Selector's memory is protected against line power failures by a battery backup capable of maintaining storage for at least ten days. And the robot's positioning motors and high-precision stainless steel gears are housed in a solid cast aluminum body. Actuator rods and water damage are yesterday's headaches.

We Haven't Been Around For Long, But We Plan to Be.

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And Now A Few Words About... by Mike L. Gustafson

Those of us who had the honor of building some of the early satellite TV systems in our garages and backyards often took pride in how complicated the equipment really was. We would often tell our admiring friends that all this mish-mash of wires was no big deal to put together, anyone with half a wit could do the same. Of course we secretly knew, and hoped, that it really was so complicated that no one except a few of us engineers could really put a system together and have it work.

As the industry matured and grew and the systems became more civilized, (easier to understand and install), we often heard that the only way to really insure a quality and technically correct installation was to hire a qualified installation technician. We were all deluged with horror stories about how poorly some consumer-installed system performed before a 'qualified' installer arrived on the scene and set the system right.

By now you are probably wondering if I am going to suggest that all the black magic that must go into a home satellite earth station really can be mastered by someone who can't even screw in a light bulb, right? No, I am not, but if you are at all handy with a shovel and you can read, you can reduce a majority of the installation cost, if not do 100 percent of it all yourself. If you combine the new simple block downconversion receiver systems and the well-written installation and operation manuals, you can hardly go wrong.

Most of the cost associated with installing an earth station is the time and effort of assembling the antenna, digging a hole for the pole mount and digging the trench for the conduit. None of these tasks are all that hard nor require any great intelligence, only the ability to read directions and get a little dirty. Doing your own installation will certainly take longer than the professional installer will take, but what do you have more of, time or money? Don't get me wrong, a professionally installed system is worth every penny it costs you, but why not give it a try yourself. Most dealers will let you go as far as you can, then step in and finish the job. Of course, if you break something or do a poor job, the total cost could be higher than if you had the dealer do it all in the first place.

As an example, let me regale you with a short story about a good friend of mine who successfully installed his own satellite system with only the instructions that came with the equipment. Our story begins with a phone call from Dale Trink of Bend, Oregon. Dale and I go back about 13 years when we both were keeping the city streets safe from the ne'er-do-wells. But that's a story for another time. Dale was calling to get my opinion on which system he should buy to relieve the doldrums up in Oregon. The winter storms were about to set in and he needed to pick up a system quick. Well, I allowed that what good was having a friend in the satellite earth station business if he couldn't get a deal, a brother-in-law discount as it were.

I must have hit the right number because he said he would be down to pick up the system that weekend. The system I gave to Dale was complete with matching power drive and programmable receiver. As I laid all the equipment out on the floor of my garage I started to have my doubts that he could install all this stuff without any technical help. Dale brought his son Donald with him and like most young boys and girls today, he was not afraid of electronic things. So I hoped that Donald would pay attention to what I said and come through to save me a trip up to Oregon on Air Cherokee. Donald and I kept making jokes about how long it would take Dale to assemble the whole system. We started out with a six month estimate and ended with a minimum of two years required to unpack all the boxes.

Let me take a moment and tell you about Dale's background. If you need a deer brought down at 400 yards, he's your man. If you need your 4x4 truck overhauled so it will climb straight up and not even work hard, give him a call. If you need a light bulb installed correctly, well give him a little time, he will get the job done if the instructions are complete enough. Don't get me wrong now, I like Dale a lot, but electronics is definitely not his strong suit.

With all the required parts that make up a ten foot antenna satellite system loaded on top and in the rear of Dale's Blazer, off he disappeared into the sunset. I braced myself for a flurry of calls over the next four weeks as he and Donald struggled to get their system up and running. What I met with was total silence. Well, no news was good news, right? Two weeks went by and still no calls, was my phone still working? The phone company assured me that all long distance lines between the San Francisco bay area and Bend, Oregon were up and working fine. Oh well, never go looking for trouble is my motto, it generally finds me fast enough when it needs to.

Finally, the phone rang and it was Dale, I hesitated to ask, but my curosity got the better of me so I asked, "How is

See **A Few Words** on page 84

Doing your own installation will certainly take longer than the professional installer will take, but what do you have more of, time or money? Don't get me wrong, a professionally installed system is worth every penny it costs you, but why not give it a try yourself. Most dealers will let you go as far as you can, then step in and finish the job.

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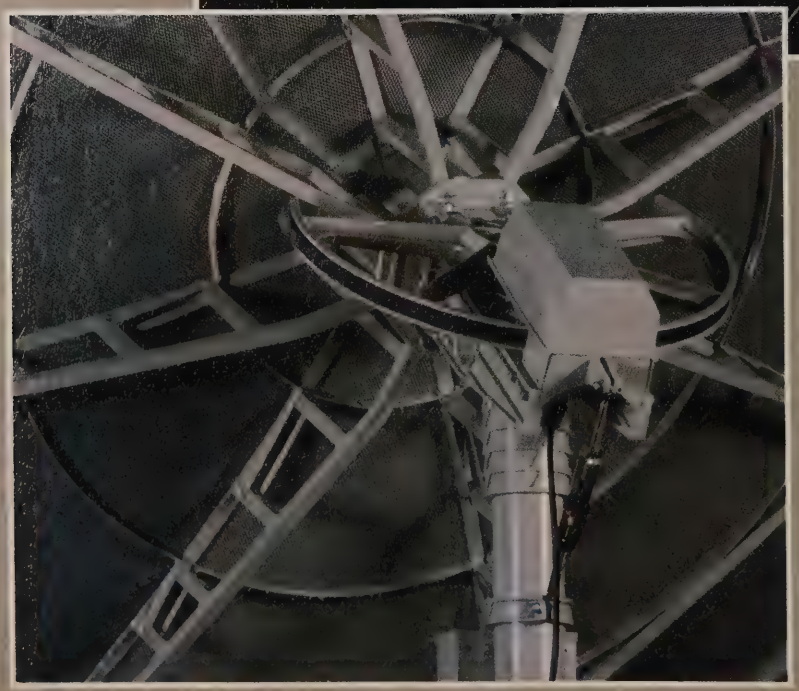

RIGIDITY For an antenna to produce a sharp, clean picture it has to maintain a very high degree of parabolic symmetry. The structural integrity of any antenna design will greatly influence its gain and beamwidth characteristics. Strength is critical for good performance.

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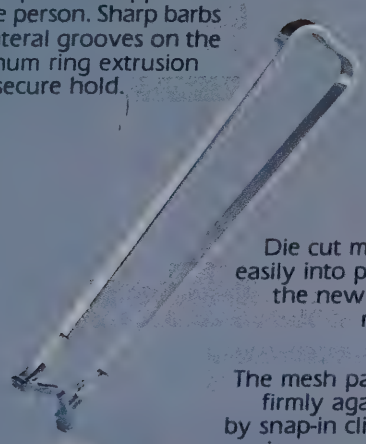
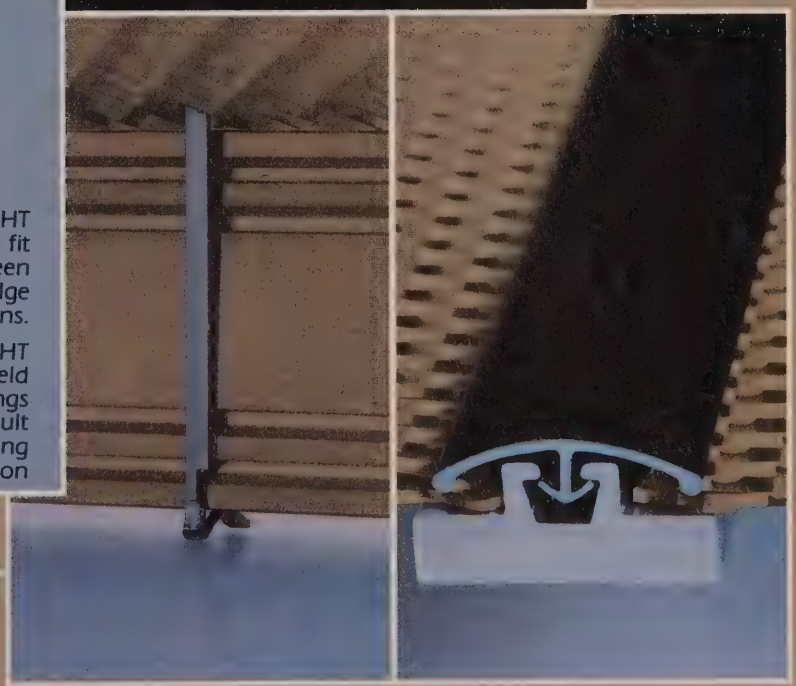


FAR RIGHT
Die cut mesh panels fit easily into place between the new leading edge rib extrusions.

RIGHT
The mesh panels are held firmly against the rings by snap-in clips. The result is a very clean looking mesh installation



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Spacewatch

by Jeffrey Manber

Move over Sesame Street. Scheduled for early 1986 is the first educational program direct from outer space.

One of the major problems facing space enthusiasts is that few educational institutes are capable of communicating to their students the commercial opportunities of space. The frontier of space is handled gingerly—a paragraph or two devoted to the space race between the Soviet Union and the United States, culminating in Neil Armstrong's historic steps on the moon.

NASA officials have long stated that it is the school children of today who must grow up considering space as a legitimate arena for this nation to pursue. To promote this belief NASA has selected a teacher to ride into space on the January shuttle mission. In addition to the speaking tours Christa McAuliffe will give when she returns from space, her duties during the flight will include the first educational program broadcast live from space.

The program is an ambitious effort to undertake a direct satellite broadcast into hundreds of schools across the country.

The first live lesson conducted during the mission will be entitled "The Ultimate Field Trip," which will allow students to compare daily life on the shuttle with normal activities on the ground. McAuliffe will guide viewers on a tour of the shuttle, showing the control panel and computers which guide the spacecraft, the shower, exercise equipment, and provide a glimpse as to how shuttle astronauts occupy their spare time.

The second lesson will be an overview of the commercial opportunities in space. "Where We've Been, Where We're Going," will demonstrate the advantages of manufacturing in the microgravity environment. This lesson will probably explain the reasons why companies ranging from pharmaceutical firms to semiconductor manufacturers are gearing up space research projects.

These two lessons will be broadcast live during the mission. Several lessons will be taped in space for later use. These, according to NASA officials, will include a demonstration of earth's magnetism in space, a demonstration of Newton's laws in zero gravity, and a discussion of the effects of microgravity on everything from the growth of plants to the operation of simple tools. Also under discussion in these films will be several more technical subjects for the older students.

The January mission is also scheduled to fly three student suggested research projects. These experiments are concerned with crystal growth, the study of chicken embryo development in space, and the effect of weightlessness on metal strength.

The long-term importance of these projects cannot be over-estimated. The psychological barriers to working in space are as formidable as are the technical challenges.

NASA realizes that its space program is today laying the foundation for tomorrow's generation of explorers, and who knows what ideas or career decisions will be influenced by teacher McAuliffe's lessons from low-earth orbit?

The October mission of the space shuttle represented the first time that a foreign country (West Germany) had rented out an entire mission. For $64 million, the West Germans had the opportunity to undertake over 70 experiments in microgravity. For the record, NASA officials are delighted by the international interest in the space shuttle program and the willingness of the Europeans to spend money on space research. Over the long-haul, however, there is some disappointment regarding the lead the Europeans are taking in understanding the commercial opportunities of space. The West Germans must have convinced themselves of the value of space manufacturing. One million dollars per experiment is an expensive undertaking for the accumulation of scientific knowledge. Of course, we can only blame ourselves, but NASA must be perplexed as to why some of our allies have responded to the space shuttle program with a greater enthusiasm and awareness than our own corporations and research institutes.

The West Germans have made a decision to concentrate on a specific space field, given their inability to match the United States funding levels. Their choice of materials processing will probably reap dividends in the next decade, as their researchers and their business community enjoy a better understanding of what can and cannot be accomplished in space.

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The opinions expressed in this column are those of the author, and do not necessarily reflect the editorial views of STV® Magazine.

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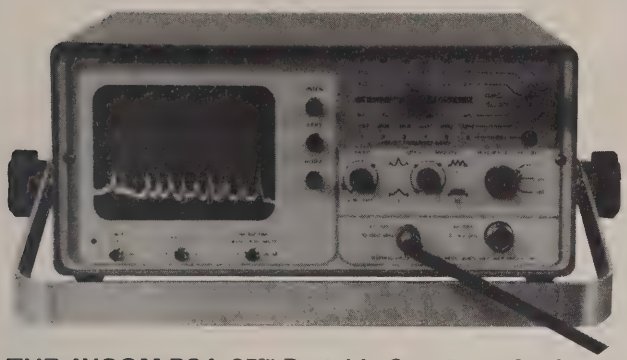

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"We use it every day, we test everything with it, too bad we didn't have it 5 years ago. We used it just the other day to solve a problem at an ABC affiliate with the ABC engineer out of New York and Compucon out of Dallas."

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Consumer Problems

Dear **STV**,

I really enjoy your magazine. I've had a lot of my own questions answered in your Mailbag section. I do have one question that remains unanswered.

Is there a receiver that picks up both the C-band and Ku-band? If not, what do I have to do to receive both signals?

Joe Burton
Louisville, KY

Three recent block receivers that were designed for 4/12 GHz reception are the Gensat CDR 412, the Chaparral Sierra, and the Luxor 9900. There are two considerations when proposing to use 4 GHz equipment on 12 GHz birds:
(1) Does the 4 GHz receiver have a video invert button? Depending on the make of 12 GHz LNB you choose (upper or lower L.O. injection) the invert switch will be required. If you view 4 GHz normal and 12 GHz inverted the Ku-band channel numbers will be reversed (ie 24 = 1).
(2) If you have a synthesized receiver you must be able to detune the center frequency of the C-Band channels + or –9.9 MHz to center tune on 12 GHz channels. Few synthesized receivers have this feature and those that do allow for only 2 to 5 MHz detuning.

Dear **STV**,

I have severe microwave problems. I have tried a combo of filters and I am not pleased. I have seen a dish with screens attached and would like to try that. Do you know of a company that makes them or do-it-yourself instructions? Do they work?

Don Anderson
Chino, CA

Attaching a shroud to the perimeter of your antenna will shield the LNA from microwave interference that is originating from the side or the rear of the antenna but will have no effect on interference entering directly from the front. Contact the following companies for information about shielding.

Continental Satellite, Clackamas, OR
1-800-331-2774

Microwave Filter, Syracuse, N.Y.
1-800-448-1666

Dear **STV**,

I have a Wilson YM-1000 receiver which I am using with two TV sets, but on the second set I can only receive what the first set is receiving. I am using a 100 degree LNA. The distance from the dish to the first set is 40 feet and the distance from the first set to the second set is 45 feet. The dish is no more than 50 feet from either set.

I would like to add a receiver to the second TV set and install the necessary components to receive 24 stations on the second set regardless of what polarity the first set is on.

Would it be better to use the Wilson YM-1000 in conjunction with another receiver or would it be better to switch to two block down receivers? Please advise me on this and send me a list of all components and material I will need to do this.

Alton Turner
Lynchburg, VA

Using a block system would certainly simplify the installation and eliminate cross interference problems that can occur when using two single conversion receivers such as the Wilson YM-1000. However, your major consideration will be the requirement for a dual feed system with complex switching enabling reception of both polarities at each receiver. Two LNAs, two downconverters and two IF cables will be required with appropriate coaxial switching. I suggest you contact Gensat at 416-736-4555 and ask them to send you a copy of their MTVRO applications booklet. STV will be running a series of articles on multiple receiver set up in the near future. Stay tuned!

Dear **STV**,

I have a STS system with a 10 foot Aluminum Spun dish.

(1) I covered my actuator motor with heavy-duty aluminum foil held in place with duct tape. It looks cheap, but keeps it waterproof. I haven't covered the other end yet.

(2) I'm very unhappy with the ½ inch bolt bearings that my system pivots on. Recommend some up grade comments on these for long life.

(3) I enjoy channel 11 on Anik D, the CBC northern station. What's involved with descrambling the other Canadian stations?

(4) We also enjoy BBC type comedy. Is it up there and how do I get it?

(5) Should I do anything special regarding grounding my dish and protecting my complete system from lightning? I lost a new TV a couple of years ago that way.

Thanks again for all the good information. I will never forget "Revenge of the Hi-Tech Pirates," **STV** November '85. Will it start some right moves?

M.E. McDonald
Baton Rouge, LA

A ½ inch bolt at the pivot points is not sufficient for a 10 foot antenna in high wind and icing conditions. Change the rod end to a ¾" and use a good quality grade 6 bolt. As for lightning protection, see the article in the January '85 STV. There are a few BBC shows on satellite such as Benny Hill. The Discovery Channel uses BBC documentary programming on a regular basis. The archive's at the BBC are full of good comedy shows such as "On The Buses," "Excuse My English" and "Some Mothers Do Have Them." Perhaps some enterprising North American programmers will take advantage of more of the BBC's great library of weekly shows. The scrambled signals on Anik D are handled by CanCom and use the Oak Orion descrambler—unfortunately CanCom cannot sell this service outside of Canada. If you wish to talk to them call CanCom at 416-968-9180.

Ⓢ Ⓣ Ⓥ

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Protect Your Viewing Rights

Join SPACE, the satellite television industry association, to demonstrate to Congress your support of legislation which will guarantee access to scrambled satellite programming at reasonable fees.

We Need Each Other

We need each other now to help ensure that programmers are not coerced by the cable industry to scramble.

From 1980-1983, manufacturers, distributors, dealers and consumers—through SPACE—prevented four bills from passing in Congress that would have made the use of satellite earth stations illegal.

In 1984, SPACE ensured the legality of the use of satellite earth stations through passage of the 1984 Cable Communications Policy Act.

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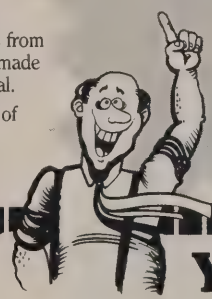

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Your membership supports the legislative battles to guarantee your right to view satellite television.

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(703) 549-6990

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City: _____ State: _____ Zip: _____

Optional: Please accept $ _____ as a contribution towards the Viewing Rights Fund to support SPACE's activities.

☐ Additionally, I would like to receive a year's subscription to SATVISION, the industry trade association's monthly magazine for $35.00. Please enclose check with coupon.

The Future is Here and Now for TVRO Owners

by J. Daniel Gifford

Teletext is in your living room right now... and you probably never even knew it.

That's not too surprising, really, because you'd have to go a long way to line up ten people who even know what teletext is, much less where to find it or what's on it. However, teletext is going to be one of the hottest communication issues of the late 1980s, and in a few years everyone—even grandma and the guy next door who doesn't have a TV—will know about this unique service. As a satellite dish owner, you are in a unique position to start viewing teletext now, not a few years down the road, and all you need is an inexpensive decoder.

First, though, let's clear up some confusion: teletext is not videotext. The latter is a two-way data system that uses a cable-TV network or telephone line for operation. The user communicates over this link with the host computer, which then sends the requested data back for display on the TV screen. There are several videotext services in operation in the US, the largest (Viewtron) in southern Florida. They all have two things in common: stiff user fees ($20-$30 a month or more) and the fact that they are all losing giant sums for their operators.

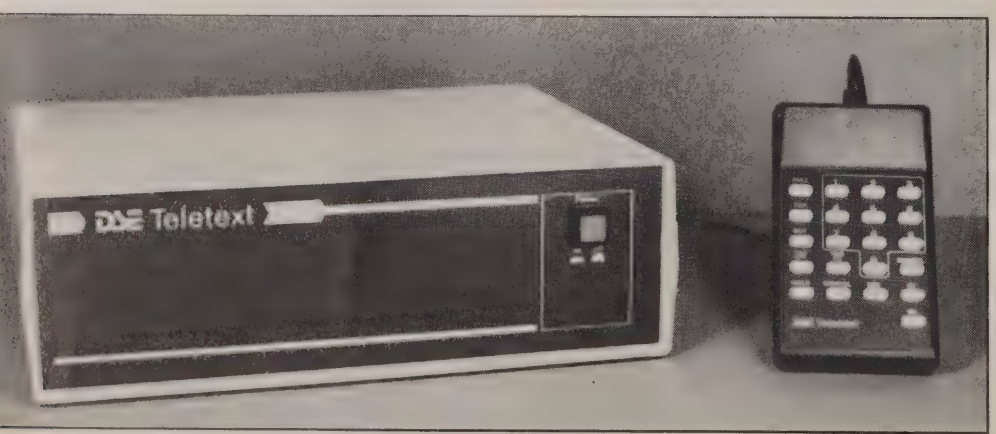
Teletext, on the other hand, is a one-way data transmission system, although its operation is designed to closely mimic the more complex and expensive interactive videotext systems. The data in a teletext system is sent out as part of a regular TV video signal, be it on cable, satellite, or regular broadcast TV. (Hey, remember broadcast TV?) If a viewer can receive that particular channel, he can also receive the teletext service it carries.

Unlike videotext services, teletext services (or 'magazines') are both free of charge and growing in size and number. By 1990 or so, nearly every city in the US will have a local teletext service available. Some of these will be produced by the station that broadcasts them, and some will be purchased from an outside programmer—just like regular TV programming.

Broadcast teletext services will grow substantially over the next few years, but the only such services available at present are found in large cities such as Cincinnati, Chicago, Los Angeles, Boston, and New York. The only exception to this is a service broadcast in smaller cities across the state of Wisconsin.

However, we are talking about now, and now means teletext on satellite. There are three major teletext services available, on the two most popular birds— Galaxy 1 and Satcom F3R— and more will be available in the near future. (All three magazines, incidentally, are also available from any cable system carrying the three channels.)

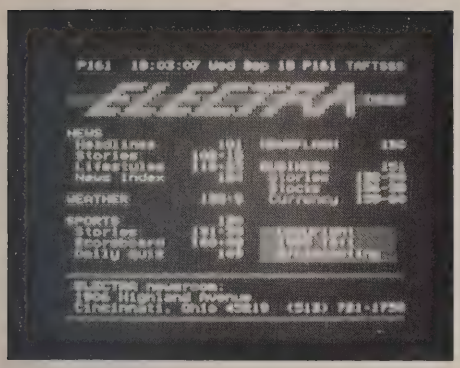
We'll look at the services themselves in a moment. First, let's look at the mechanics of teletext itself.

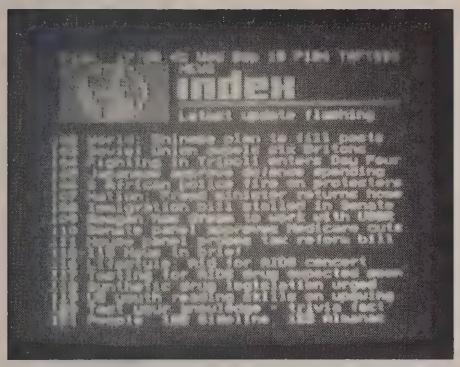


A typical teletext decoder and remote control are shown above.

Teletext Broadcasting

If you've ever had your TV picture roll vertically (and who hasn't), you've seen the vertical blanking interval—it's the black stripe between the top and bottom of the picture. Technically, the vertical blanking interval (or VBI) is 21 blank lines





Like a regular magazine, teletext provides a table of contents and updates.

of the TV picture, a repeated pause in image transmission used to give the scanning electron beam time to return to the upper left corner of the screen to begin the next image frame. This empty space can be used to carry all sorts of data not related to the video image, such as VIR and VIT test signals, closed-caption information (another form of teletext), and of course teletext itself.

In 1983, after much lobbying and battling over standards, the FCC authorized the use of several lines of the VBI to carry teletext. However, they declined to specify a broadcast format, with the intent of letting the market sort itself out. The regrettable result of this non-decision is that there are two incompatible teletext systems in use in the US. One system, however, has garnered a large share of the market.

This system, now known as World System Teletext or WST, originated in Britain in the early 1970s and was known until recently by the informal title of 'the British standard'. It was the first operational teletext system, and is the only one with a ten-year history of operation, although France's Antiope and Canada's Telidon systems have been around almost as long.

WST is used throughout Britain, Australia, and much of Europe; there are at least as many broadcasters (and decoders to match) using the WST system as there are broadcasters using all other systems combined. However, WST has what many US broadcasters regarded as a fatal flaw: its graphics are of the rather crude alphamosaic or block type, which they felt would be unacceptable to US viewers. Much of the standards battle that occupied the teletext field in the US in the late 1970s and early 1980s concerned this supposed drawback.

The result was that most of the big guns in the US communications field—IBM, AT&T, CBS, and NBC among them—lined up in support of an awful committee-derived standard called North American Broadcast Teletext Standard, or NABTS. The primary advantage of NABTS over WST is its sophisticated redefinable graphics system, which can be used to produce near-photographic quality images. However, NABTS has two severe drawbacks to counter this advantage. First, the equipment needed to broadcast and receive NABTS teletext is much more expensive than that needed for WST—as much as two to three times as costly. Second, and much more important, is the fact that NABTS transmissions have an extremely low tolerance for transmission error. With WST transmissions, static or sparklies will result in missing or extra characters, or occasionally missing lines in the teletext display. The largest part of the image will be displayed, however, and it tends to be self-correcting. With NABTS broadcasts, even a small amount of interference will result in non-acquisition of the data and a blank screen is all you'll get.

A number of industry observers have noted that graphics are not the point of teletext; the information it carries is the point. No one, they correctly state, will switch from a movie or football game to a teletext service because of great graphics. Similarly, a teletext viewer is not likely to switch off in disgust because of blocky graphics.

The FCC chose to let the market decide, and it did—with a vengeance. Some 95% of all teletext services in the US use the sturdy WST format.

Teletext Operation

Differences aside, both teletext systems—indeed, all teletext systems—operate in much the same manner. A block diagram of a typical teletext system is shown in Figure 1.

The teletext magazine is composed page by page—each page being an individual screen of text and graphics—by an editor sitting at an entry and composition terminal. Many pages, of course, are pre-composed (weather and sports scores pages, for example) and only need the insertion of current numbers for completion. The pages are sent to the host computer (usually a mini such as a PDP-11 or IBM 3240), which cycles them in an endless loop according to its instructions. This cycled data is sent to a device called a data bridge, which inserts the data into the VBI of the video signal. Although a satellite link is shown, there is no fundamental difference between it, a cable system, or a regular TV broadcast.

At the reception end, all that is required is a clear TV signal carrying the teletext data, and a decoder to extract it

Sample 'pages' of a magazine are shown in the photos above.

and turn it back into viewable pages. There are two types of decoders: those built into the TV set and operated by the same remote control, and those add-on types that sit on top of the TV. The built-in types will probably be the most common, eventually, but at present teletext-equipped TVs are quite expensive—most in the $600-$1,000 range—and not widely available.

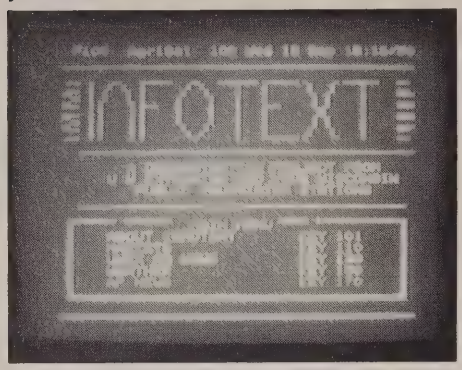
A block diagram of a set-top decoder is shown in Figure 2. Most decoders have provisions for accepting a pretuned composite video signal from a component-TV tuner or satellite receiver; some, in fact, have only this type of input. Others have a complete VHF/UHF tuner, so that any broadcast station may be dialed up. This is of course not needed for satellite teletext reception, and does drive the cost of the decoder up. (Tuner equipped decoders cost from $300 to $500 or so; those lacking tuners cost about $200.)

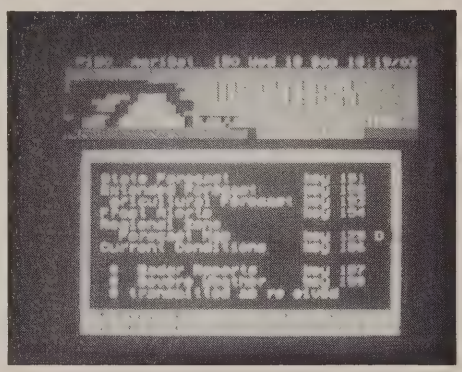
Almost all decoders have both composite outputs for connection to a monitor and a Channel 3/4 RF output for connection to a regular TV. Decoders usually have three display modes as well. The first simply passes the regular TV image (from the tuner or the composite input) through to its outputs. Second, of course, is the full-color teletext display (most teletext pages combine several brilliant colors on a black background). Finally, there is what is called Mix or Text-over-TV mode, where the text (in white) is laid over the TV image.

The teletext data is extracted from the VBI by the decoding circuitry and stored in memory. A video display generator then extracts the data from memory and converts it to a video display. A video switching circuit allows remote selection of TV, Teletext, or Mix display. These selections, page number entry, and all other functions are controlled by a handheld remote control.

When the decoder is first switched to teletext mode, it automatically seeks the main index or title page of the magazine on that channel. (In WST, the title page is always number 100.) Once that page pops up, the user can go to any other page in the system by merely entering that page number. Teletext is completely random-access in nature; there is no need to view pages in any preset order. Thus teletext closely emulates the much costlier videotext systems, almost perfectly simulating two-way data transmission.

In addition to the stock market, teletext users have access to agricultural and weather reports, to name just a few.



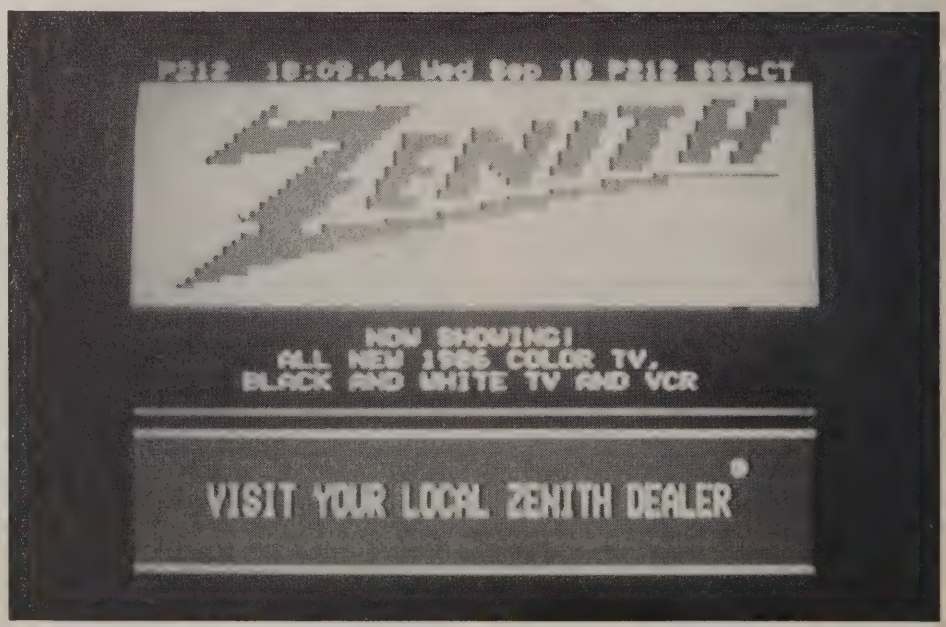


The only problem is that there is an unavoidable delay between the time that a user enters a page number and the time that that page actually comes around in the data loop. The delay is a function of how many pages there are in the magazine. Although the serial transmission means in theory that there is no limit to the number of pages a teletext service can have, keeping this delay reasonable imposes a limit of about 200 pages. Most current services are about 100 pages in length, which means an average delay of about 4 seconds and a wait of about 30 seconds.

Most services shorten the delay by transmitting some pages more than once within the data loop. Transmitting the page ten times at regular intervals during the loop, for example, means that the page will come up ten times faster. Pages such as the main title, indexes, and popular feature pages are usually transmitted in this fashion. On most services, the title page is transmitted so often that it rarely takes more than two seconds to appear, and frequently pops up without any noticeable delay.

Teletext Services

The biggest source of teletext services in a few years will be broadcast television; you'll be able to choose between national services from the networks or local services featuring local weather, road reports, community calendars, and such. However, the only widely available services at present are



No magazine would be complete without advertisements.

See **Teletext** on page 78

Pick Your Positioner

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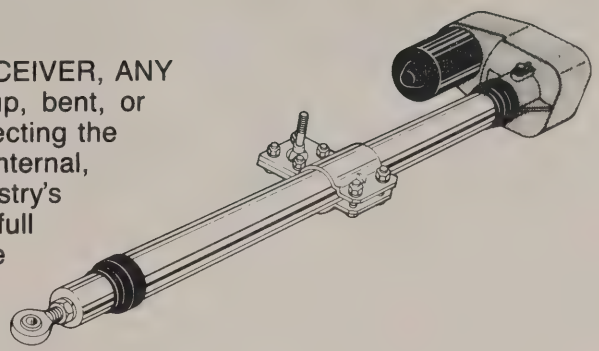
For 1986, you can use the Superwinch actuator with ANY RECEIVER, ANY CONTROLLER, new or used. Sick of call backs on frozen-up, bent, or broken actuators? Solve the problem once (and for all) by selecting the Superwinch - it's guaranteed to give you the comfort of internal, **adjustable** limits, a solid steel gear transmission, and the industry's finest defense against water and ice. As a bonus, up to a full 2,000 lbs. of thrust, depending upon the amp output of the power supply you choose.



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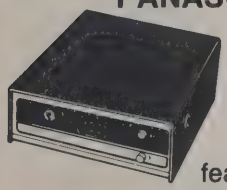
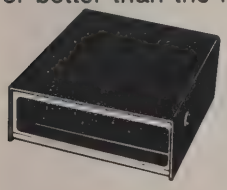


Simply plug in the phone jack from either receiver to our new controller and you've got a **remotely controlled** positioning system with parental lock-out. Its best feature - the Superwinch actuator with incredible position integrity.
Part No. 4156.

NEW: ACTUATOR & POWER SUPPLY COMBOS FOR VIEWSTAR VSS 1450 and ELECTROHOME E-1

With the Superwinch Combo, you get a compact, quiet power supply that will cut your customer's utility bills by a good $45 per year. Ours is only "on" when you're using their remote E or W button. Theirs is on all the time - burning up electricity, generating heat and, sometimes, an annoying "buzz". Fully compatible, these new combos provide you with a jack that has a quality level equal to or better than the receiver itself.



Combo for Viewstar VSS 1450:
Our Part 4176

Combo for Electrohome E-1:
Our Part 4177

NEW: ACTUATORS FOR SAGINAW, HAMMERBLOW, WARNER, DRACO, and TAIWAN REPLACEMENTS

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Part No.	Description
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4105	24V, Potentiometer, Adjustable Upper & Lower Limits
4106	24V, Reed Sensor, Adjustable Upper & Lower Limits
4107	36V, Potentiometer, No Limit Switches
4108	36V, Reed Sensor, Adjustable Upper & Switches

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A Midnight Satellite's Dream

by William Stratosphere

There I stood, in the middle of the vast wasteland. I cannot recall at the present how or when I got there. But where was 'there'? The last thing I can recall is sitting in the comfort of my bedroom watching some strange transponder. Scooby-Doo reruns, I believe. In any event, I was sincerely captivated beyond my wildest imagination—laughing uncontrollably with each rooooby-doo that reverberated across the room. Suddenly, without warning, there was a knock upon the door. A strange knock, but all the same, a knock: thump-boopa-thump. I quickly grabbed for my Japanese kimono, and hurriedly slipped on my pink, fluffy bedroom shoes. I also brushed my teeth.

"Who is it?" I called out as I stood boldly on my bed, trusty baseball glove on hand. Wait a second... something was different. Yes, something was different about my television screen. No longer did I hear those rooooby-dooooby-doos. Instead, I heard something else. I--I could not believe my ears. Instead of Scooby Doo I was getting black-and-white pictures of Johnny Mathis singing Christmas songs. "Who's there?" I screamed once again.

"Cablevision," a voice said from the other side of the door. It was a voice not at all unlike that of Truman Capote. "I got a message that you were having trouble with your cable—no picture and all. I got right over here." There was a short pause. "You know how cable companies are. We keep our customers satisfied no matter what time it is. And it is four-thirty in the morning." Another pause, and then—and then... a sneeze!

"Gesundheit," I cried, "Bless you, even. But I don't have cable. I have a satellite dish." I stopped and slowly, yet cautiously, backed myself up against the wall, preparing myself for some unknown terror about to take place. I heard a noise. Much to my dismay it was my black velvet picture of Elvis falling to the floor. Panic ensued, "What in the world do you want?"

"Look Buddy, I told you. I got a call from my dispatcher a couple of months ago and he told me to get right over here. Pronto. Here, I'll read you the note that I wrote myself. Just a minute." I heard the sound of someone going through the garbage can in the hallway.

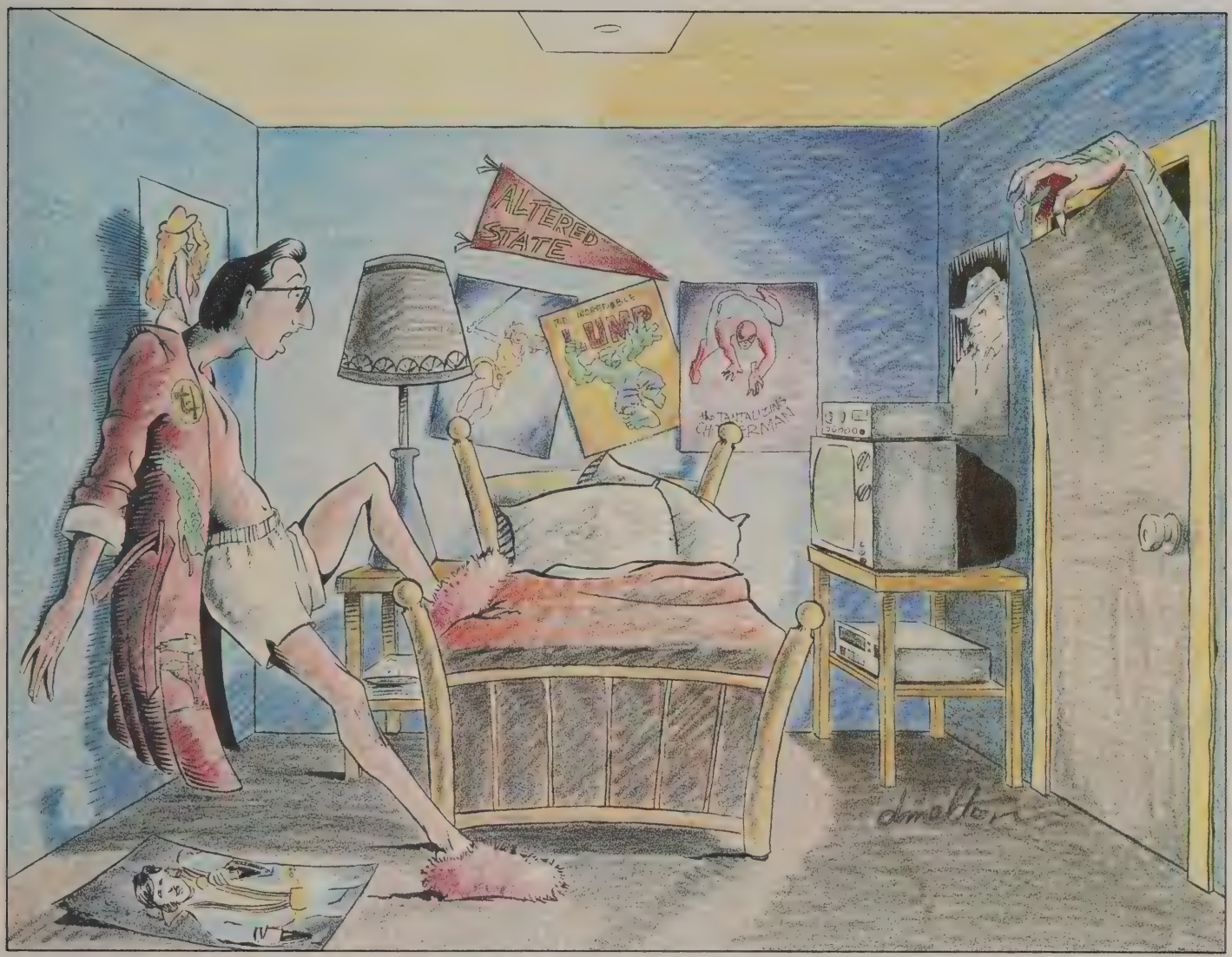
I could sense the anger raging from the other side of the door but I proceeded anyway. "It's funny to me that you cable companies never paid any attention to people like myself. That is, until we got our dishes. All of a sudden, you're trying to get me to pay for something you never even cared about before. Ha!"

The sound of paper being crunched. "Aha, here it is. It says 'man in town needs help with cable, go to his house.' See there..." Dead silence. "Now do you believe me?"

"No, as a matter of fact, I don't. And besides, you scrambled me. You knew good and well that I didn't have cable—you came here just to scramble me." I had to stop and regain my composure. I continued, "Why would you want to do that to me? I've never done anything to your cable company. I'm just an average rural American who wanted my MTV—so, I bought a satellite system. I really wanted my MTV. You know, like Sting and Pete Townsend. Anyway, I bought this system because your cable company would not run a cable out here to my igloo. Now I'm happy as a lark, and I'm not hurting anyone." I could sense the anger raging from the other side of the door but I proceeded anyway. "It's funny to me that you cable companies never paid any attention to people like myself. That is, until we got our dishes. All of a sudden, you're trying to get me to pay for something you never even cared about before. Ha!" I started breathing real heavy-like. "What do you want?" A pause, "Tell me, WHAT DO YOU WANT????????!!!!!!!!!!!????????"

"I want to sell you a descrambler for your system." There was a long pause. All I could hear through the door was a toe tapping and some change rattling. "I know you aren't hurting anyone. Sure, that's true. But we cable operators smell big money on every dish in the country... and we want it!!!" His voice sounded different now. It sounded like someone who would kick his dog or take the prize out of a kid's box of crackerjacks. "Let me in," he said "I have this nice descrambler right here in my hand for you. It's all yours for only $23,000. And, of course, $156.00 per month. Sound reasonable enough?" A devious laugh followed.

"No," I screamed "That is not reasonable!" I am not a violent person but I was getting mad. My face turned a deep lavender color. "You can have your HBO," I screamed, "You can have your Cinemax, your Movie Channel...," stopping to get my courage up I shouted at the top of my lungs, "You can even have your MTV. Yes, that's right, I don't want my MTV!!" I was angry, I was on a roll (forgetting that I had eaten in bed that night). I was standing up for my



Overcome with fear, from the top of his head to the tip of his pink scuffs, our faithful protagonist can only anticipate the horror that lurks on the other side of the door.

rights!

"You need me," he cried, "You can't live without HBO. You'll see. You neeeeeeeeed me!" All of a sudden he screamed out "Herrrrrrrrrrrrrrrrrre's Johnny," and he started chopping my door with a fork. Now was the time. For action, that is.

I quietly jumped out of my window and ran to my ten foot satellite dish. By the time I got there I was out of breath and sweating like a Russian race horse. Reaching the dish, I picked it up, knowing that I was racing against the clock. I knew that in a matter of a few minutes that cableman would have connected a descrambler to my system, leaving nothing but a bill for $23,000. Heaving and hoisting, I slowly made my way back to the bedroom, carefully balancing the dish on my muscular shoulder blades. I then pushed the dish through the window and, as fast as I could, I set it up with the feedhorn pointing in the direction of the door.

"This is it," I yelled, "I'm going to blow you all the way to Galaxy 1. I'm turning my amp up—full power!" I hit the power button on the amp and then crossed my fingers. It started out as a quiet hum, barely audible. It got increasingly louder until I heard an ear-piercing scream from the other side of the door. All was then quiet.

Slowly, I approached the door and opened it. I could feel a slight smile forming on my lips. There, lying on the floor, was a pair of smoking boots and a copy of OnSat. My dish had won!

So, here I am. I do know where I am now. No, I never did get a descrambler. Yes, HBO did indeed scramble and I can no longer tune it in on my system. I simply have to sweat it out by sitting here in the comfort of my room and watching the other hundred channels. What's more, I don't even miss HBO. Just remember, if you're ever looking up in the sky on a clear night and you happen to see a little black splotch on Galaxy 1, just wave. That cable man is finally in his place...

The End

The Moral: Why buy a hamburger when you own the restaurant?

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Surveying A Site

by John Copeland

Not every landscape is fortunate enough to have a choice spot in which to install a satellite receiving antenna. Several factors determine how and where the antenna can be situated and how well it will perform. In some situations, non-technical factors such as zoning or neighborhood opinions may lead to the antenna's demise prior to its installation.

Personally, I think a satellite antenna is a beautiful piece of equipment and there are very few systems that I would not be proud to display in my front yard. Some neighbors decline to share my feelings (I think jealousy is an attributing factor) and a little psychology sometimes helps. An example of this is a situation that took place because of a neighbor's fence. I moved in next door, and since I was going to benefit from his new cedar fence he felt I should share the cost. After giving the matter some thought I agreed and shared my desire to paint my half yellow....he decided to retain ownership. Well, so much for logistics.

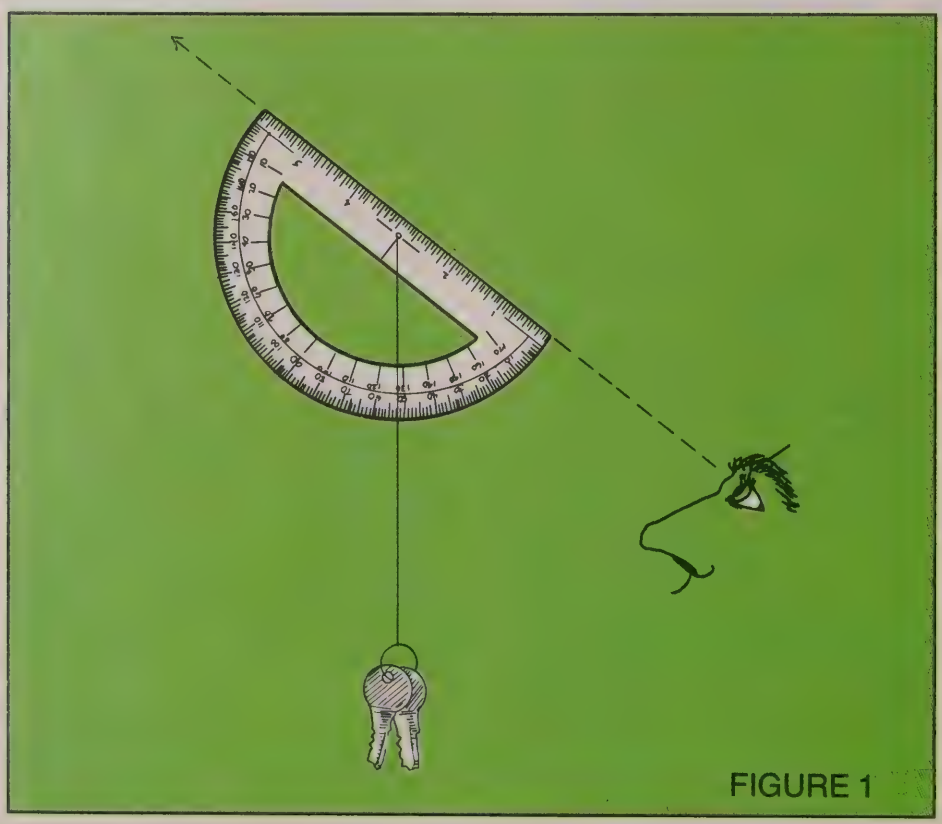

FIGURE 1

The first factor to consider is, "will the antenna have an unobstructed view of the entire satellite arc?" It is short-sighted to consider present programming placement. Satellites have a predicted lifetime and programmers sometimes move about. One little meteor or a loose connection can cause a mass exodus to another bird. The look angles for the entire arc may be calculated, but the simplest, least expensive method is to obtain a "Satellite Aiming Guide" from **STV®**. When calculating look angles, several formulas are involved and each must be repeated for every satellite angle. One little slip of pencil or procedure and the antenna could end up on the other side of the house looking at the north pole.

Armed with satellite look angles, a method for sighting the area is necessary. This may be performed with several devices; from a protractor and a trusty compass to a transit (although transits generally have limited

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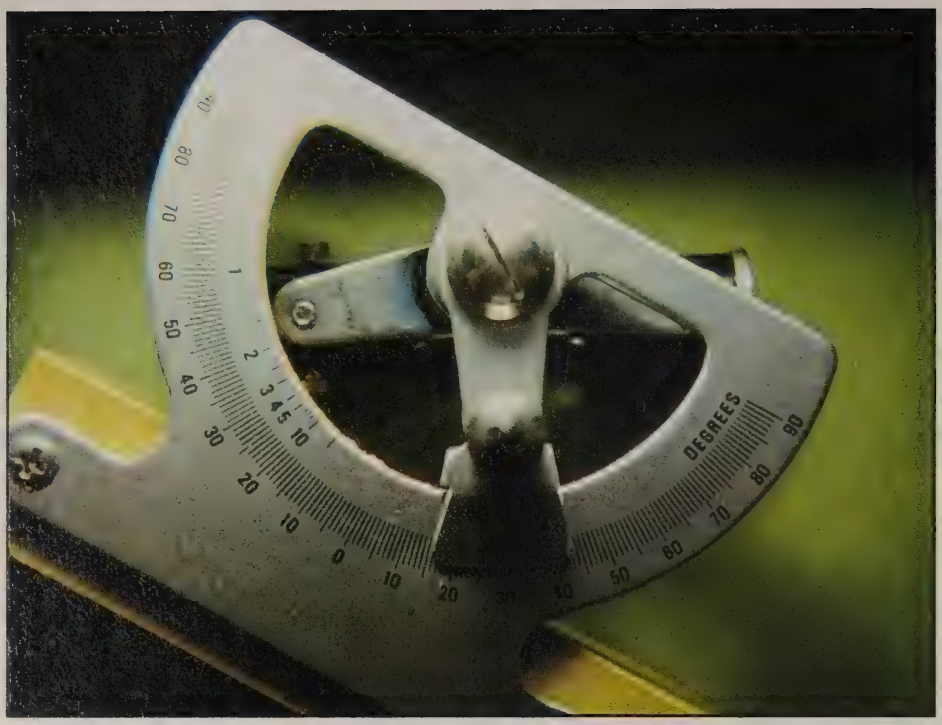

A German made deluxe clinometer can be used to verify an unobstructed view of the satellites.

elevation). A protractor with a string and small weight (as shown in figure 1) can verify an unobstructed elevation for a given azimuth (compass reading). This method is not very professional looking but it works. A better device would be an inclinometer. The unit shown in photo 1 is a German made deluxe clinometer and contains a bubble type level (see photo 2). This type is available through some satellite equipment distributors. The advantage of this unit is that it contains a small, angled mirror inside its telescope-type barrel, allowing the viewer to see the level indicator while looking at obstructions (or the absence of obstructions). Merely set the level to the desired elevation on the protractor type scale, point the clinometer to the azimuth of the satellite in question (see photo 3), and raise the unit till the bubble is visible. If no obstructions are sighted, you have a good look angle; the radius of the reflector must also be considered. Once the whole arc is sighted, and a clear view is confirmed, the future should be considered. Are there any trees that will grow into the path? Will the neighbor build a garage or the power company install a pole?

Another consideration is TI or terrestrial interference. Several types of interference can affect reception, such as ground noise, cosmic noise, solar noise, etc., but none are as detrimental as microwave interference from telephone microwave links. Several methods can be used to determine if your TVRO is subject to TI. The presence of towers with microwave reflectors is a bad sign, but all is not necessarily lost. They may be operating at a non-interfering frequency or you may not be close enough to the path for reception. Also, shielding techniques and filters can eliminate TI. Microwave links sometimes span 25 or more miles and, depending on the system, are highly directional. In the past, the FCC (Federal Communication Commission) allowed the use of passive reflectors which permitted the transmitting and/or receiving reflector to be mounted low to the ground, pointing up to the angled passive on the tower. Recently, users of passives have been required to justify their use or remove them due to 'signal splatter' (radiation in other than the desired direction).

Another consideration is TI or terrestrial interference. Several types of interference can affect reception, such as ground noise, cosmic noise, solar noise, etc., but none are as detrimental as microwave interference from telephone microwave links.

There are companies that specialize in site survey reports of possible microwave interference for a given location. Also, maps may be purchased of microwave paths. There is a method of looking for TI using a TV, satellite

The level on the clinometer allows you to simultaneously view the level indicator and obstructions.

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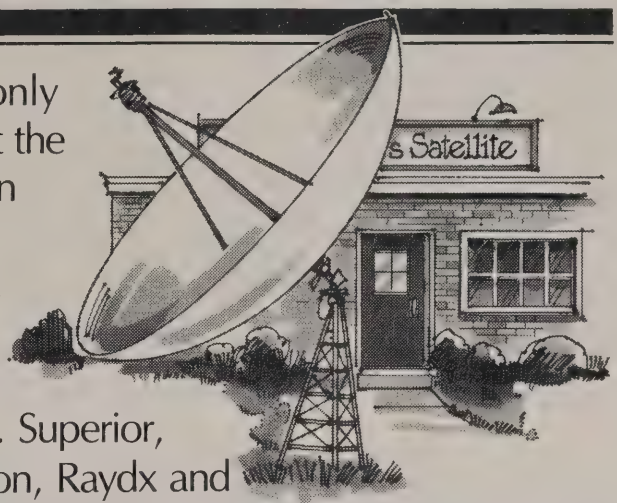

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Mr. Copeland demonstrates how easily the clinometer can be aimed.

receiver, and LNA. With the equipment hooked up at the site, the LNA is pointed in all directions (mainly the satellite arc) and any presence of TI should be displayed on the TV screen.

Once a clear shot at the satellites is confirmed, the next question is three-fold. How far is the antenna from the electronics, how to route the cables, and can I dig a hole here? The routing of cables was covered in the May/85 issue of *STV* under "Wiring Techniques." The distance of cables will be covered later, so for now let's consider the hole.

The size of the hole will be determined by the type and size of reflector and wind loading requirements. The type of ground, building codes, and the size of the hole will determine what you dig it with, but before I ever broke the soil I would want to know what is below the surface. Underground utilities, septic lines, and the like are quite often not considered and the consequences can be inconvenient, expensive, and possibly dangerous. When underground utilities are present, the companies involved should be notified and given the opportunity to 'spot' the lines. Failure to do so could make you liable for repairs. Once a line is cut, an unamusing scenario can unfold. The phone company arrives to repair a cut line and in the process cuts the power, the power company cuts the cable, the cable company cuts the gas, the gas company cuts the water, the water company cuts the phone again and so on. This can go on for weeks. This mainly occurs in easements (hopefully, you are not installing a system in an easement). When underground utilities are present in easements, they are also present between the easement and the house. When in doubt, the best policy is to notify. Alternative foundations can be used should a problem occur with underground obstructions.

The show mount allows the pole to be re-leveled if the ground shifts.

Since the antenna pole should remain level, shifting is a consideration. Foundation specs specify 'extending the foundation to the frost line.' Loose soils can also lend to foundation shifting. The 'show mount' type design in photo 4, although more expensive on the front end, is very practical if shifting is anticipated. Should the foundation ever shift, the pole may be re-leveled very easily.

The distance between the antenna and the electronics is a very important consideration. In long runs of cable, the RF attenuation and the voltage drop due to an increase in resistance of wiring can affect the system operation. Both can be overcome, to an extent, but more expense will be involved. Line powered amplifiers, lower loss cable, or a combination can be used to overcome signal loss. Larger gauge (smaller number), lower resistance wiring will off-set the voltage problem. Most electronic signal processing equipment of a TVRO system is line powered through the same path the RF follows. Coaxial cables have a loop resistance rating in ohms per 1000 feet and the lower the rating, the better. Generally, a cable which satisfies the loop resistance requirement will meet the RF requirements. One additional device that may be needed on long runs using block systems is a tilt compensator. Insertion loss of coaxial cable increases with increasing frequency and unequalized cable loss can sharply decrease the carrier to noise ratio. The point to remember with distance is; an increase in loss is an increase in cost.

Many considerations are involved in surveying and selecting a site for a satellite antenna. Rarely are any two sites the same and costs of installation will vary. Roof mounts have been covered in previous issues of *STV* and are viable solutions to many obstacles. One obstacle that I did fail to mention is livestock (specifically cattle). Cows like to scratch their backs and reflectors make good back scratchers. That's an easy one to solve when the freezer is empty.

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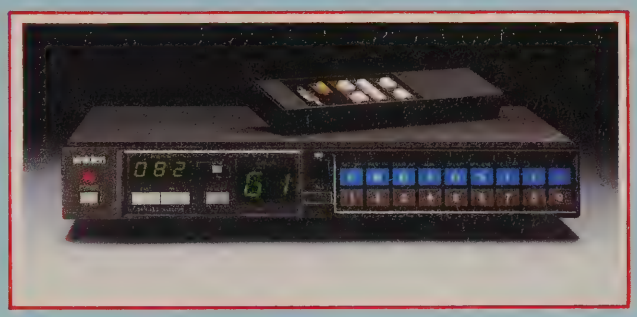

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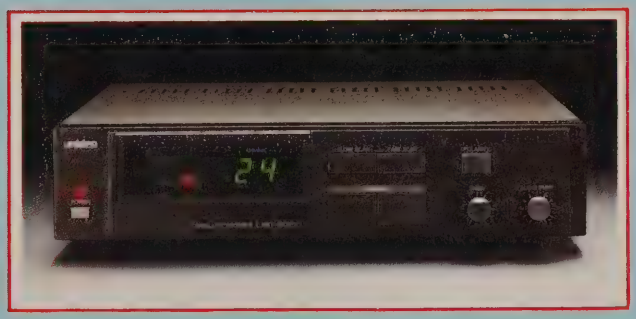

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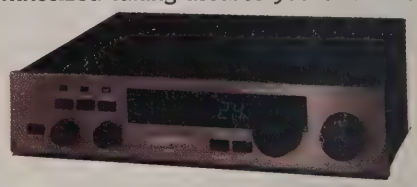
If you've been overwhelmed by the multitude of manufacturers and their products in the satellite home video industry, Arcfinder has made your best choice easy! Now with a complete line of satellite system components, Arcfinder offers an affordable package featuring state-of-the-art technology for picture quality that will satisfy even the most discriminating viewer.

Antenna Control System - The engineering superiority that goes into the Arcfinder antenna control system sets it apart from all the others. Being designed for simplicity, the antenna control provides the customer with dependable trouble free operation. There can be no memory loss ever. Nor miscounting of digital pulses. And to insure many years of continuous operation, Arcfinder has developed a unique means for preventing rust and freeze-ups in the actuator drive. Finally, one of the most pronounced attributes of the Arcfinder antenna control system, is the easy installation due to its basic four-wire connection.

Arcfinder Antenna - Arcfinder's nine foot satellite antenna dish is designed to do more than the others. First, it gathers satellite signals and brings them to you not only distortion free, but also with a superior level of clarity. Second, the tough, rigid construction allows the true parabolic curvature to maintain accuracy, year after year. Third, the four durable steel panels are individually screwed and may be replaced separately and easily in the event of vandalism or on-site accident. Finally, the Arcfinder satellite dish is designed for a long lasting, attractive appearance. Its edges are capped for a water-tight seal and the black see-through steel mesh will enhance any landscape.

Horizon Mount - Arcfinder's hidden mount allows perfect arc tracking. All steel gears will insure years of trouble-free use, and a special backlash adjustment maintains pinpoint accuracy. The neat, clean and attractive design, when combined with Arcfinders antenna dish will appeal to even the most discriminating taste.

State of the Art Receiver - Arcfinder has set a new standard in satellite receivers. Compare the crisp, clear, colorful video quality, before found only in the expensive commercial receivers. By utilizing the latest concepts in solid state technology, Arcfinder provides trouble-free viewing which will earn your confidence. Synthesized tuning assures you of uninterrupted clarity, and video fine tuning offsets interference in T.I. affected areas. Enjoy single or multiple receiver installation with the convenience of block down conversion.



Low Noise Amplifier - It's no secret that many manufacturers are producing LNA's. It's also known that most LNA's generally perform the same function comparably well due to increased and aggressive competition. Arcfinder's LNA, however, not only possesses high tech, element protected circuitry and performance, but also is distinguished by one other very important consideration . . . economy! Arcfinder's engineering magic has made it possible to obtain the same high quality isolation enjoyed by other high priced competitors without their costly pricetag.

Full Viewing Pleasure - Arcfinder brings you satellite system components that are destined to be your first viewing choice. By combining the latest technology with engineering efficiency, Arcfinder is making them available to you at a comparatively low cost. A speedy ship in/ship out is Arcfinder's policy insuring you of prompt, hassle-free servicing, and they stand behind their products completely. Arcfinder has given the system and the support that works best...for your unprecedented viewing pleasure.

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Manufacturing Inc.

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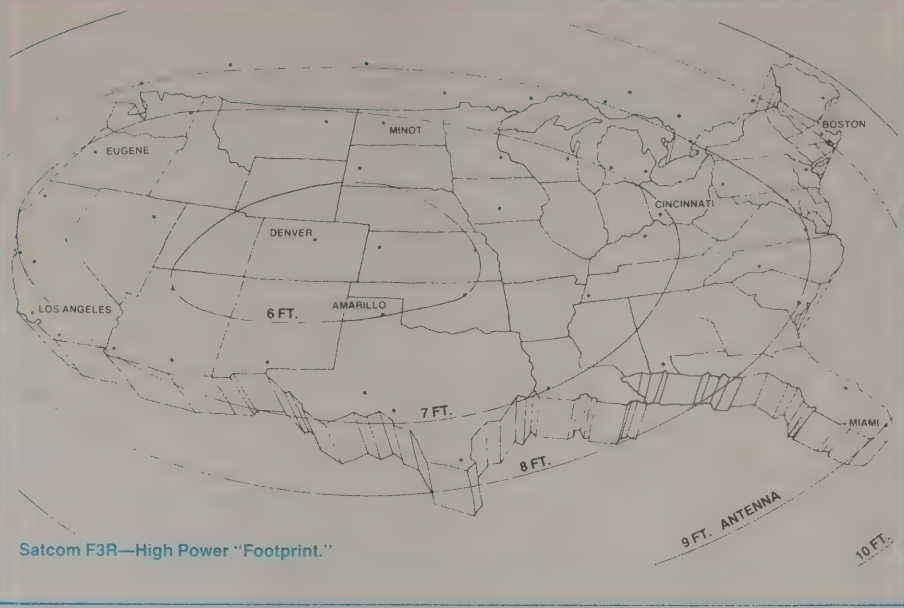
How Big Is Big?

by Christopher J. Schultheiss

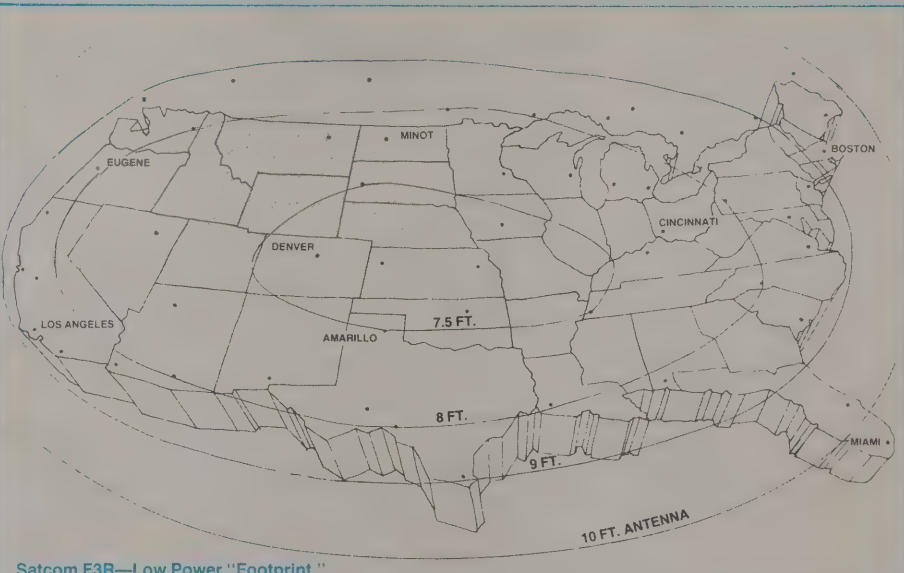
"I live in Centralia, Illinois, —what size dish should I buy?" This is a typical question asked by new STV readers planning to purchase a home satellite system. As a matter of fact, more readers ask questions about antenna size than any other topic. Choosing the right size antenna for your particular requirements need not be a difficult task and STV magazine has gathered enough information to enable you to make a wise decision.

In the summer of 1984, an unusual project was planned by the staff at STV The plan was to travel all over North America with specialized equipment which would allow actual signal strength measurements of the different satellites and their transponders. From this information, maps were compiled that plotted signal strength for each satellite against geographic location. These "contour maps" can be used as a guideline for choosing the optimum antenna size for individual locations and requirements.

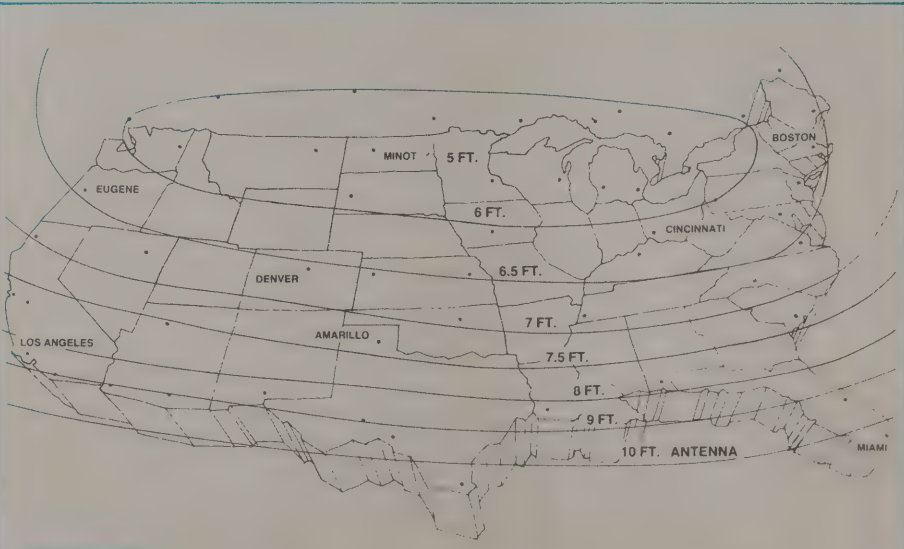
Choosing the right size antenna for your particular requirements need not be a difficult task and STV magazine has gathered enough information to enable you to make a wise decision.



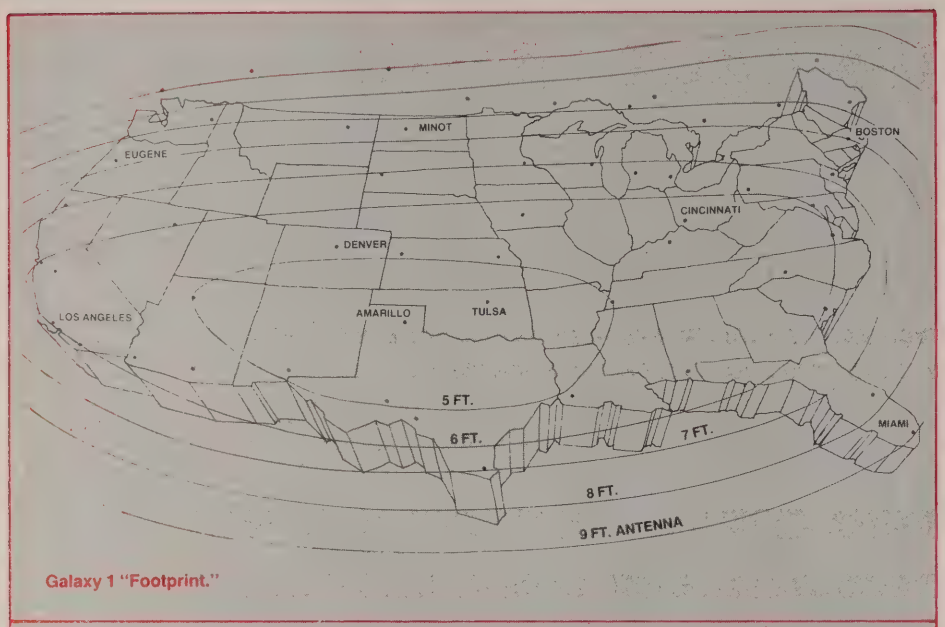
Satcom F3R—High Power "Footprint."



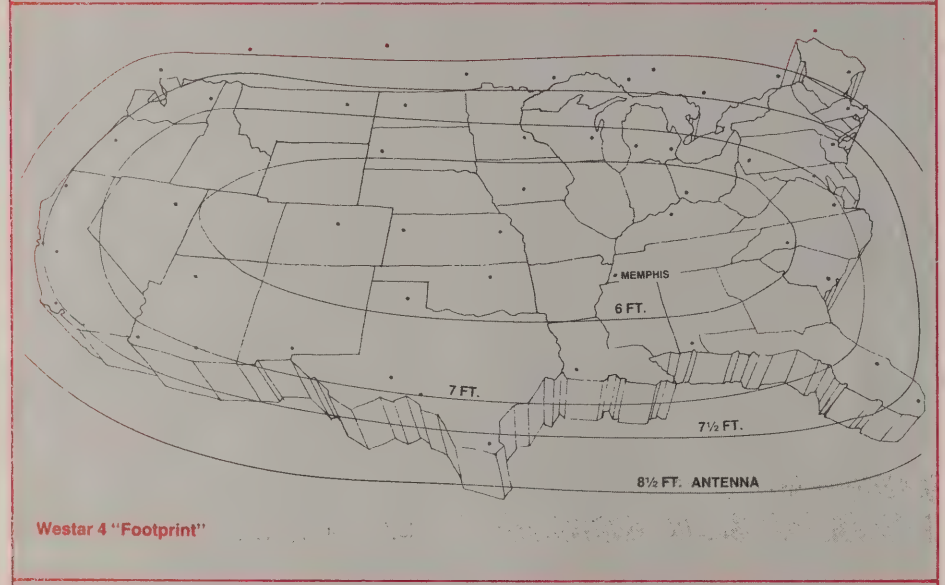
Satcom F3R—Low Power "Footprint."



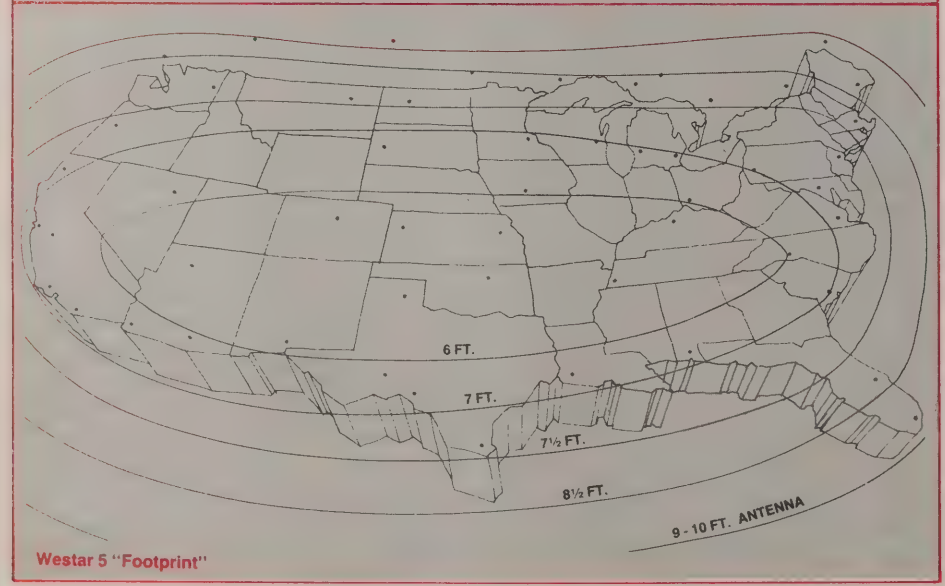
Anik D "Footprint"



Galaxy 1 "Footprint."



Westar 4 "Footprint"



Westar 5 "Footprint"

Commencing in May 1985, STV selected the major satellites and published the results in consecutive copies of the magazine. A list of the measured satellites and the month of publication can be found in this article.

No two satellites have the same signal strength or footprint and optimum antenna size must be determined by checking the signal strength for the weakest satellite in your location.

Satellite Contour Maps published by **STV**:
May '85 — Satco F3R & Galaxy 1
June '85— Westar 4 & Westar 5
Jul '85 — Anik D
Aug '85 — Satcom F4
Sept '85 — Comstar D4*
Oct '85 — Telstar 301

*No longer in operation.

No two satellites have the same signal strength or footprint and optimum antenna size must be determined by checking the signal strength for the weakest satellite in your location. Thumbing through seven different issues of STV can be burdensome, so we have decided to publish the contour maps for the eight major satellites in one issue. To make your job even easier, the maps show antenna size rather than EIRP (Effective Isotropic Radiated Power, in dBw). Keep in mind that the maps demonstrate the minimum antenna size requirements for a system using an 85 degree K low noise amplifier, an 8 dB threshold receiver, and an antenna with 55% efficiency.

If you have a situation that limits the size of antenna you can install the contour maps enclosed in this article will enable you to determine just how poor your reception will be on the weaker satellites.

If you wish to have some margin for power degradation of the satellites and performance degradation of your system, you would be well advised to select an antenna one size larger (one foot larger in diameter) than indicated on the weakest satellite's contour map.

For a given system (same LNA, receiver, motor drive, and feedhorn) the price increase versus antenna size is very reasonable. A comparison chart is shown below for a basic system consisting of a medium priced receiver, non-programmable east/west motor drive, 85 degree K LNA and a servo style feedhorn plus all necessary cabling and connectors.

In most cases, the extra margin (or headroom) provided by a larger antenna is well worth the additional cost.

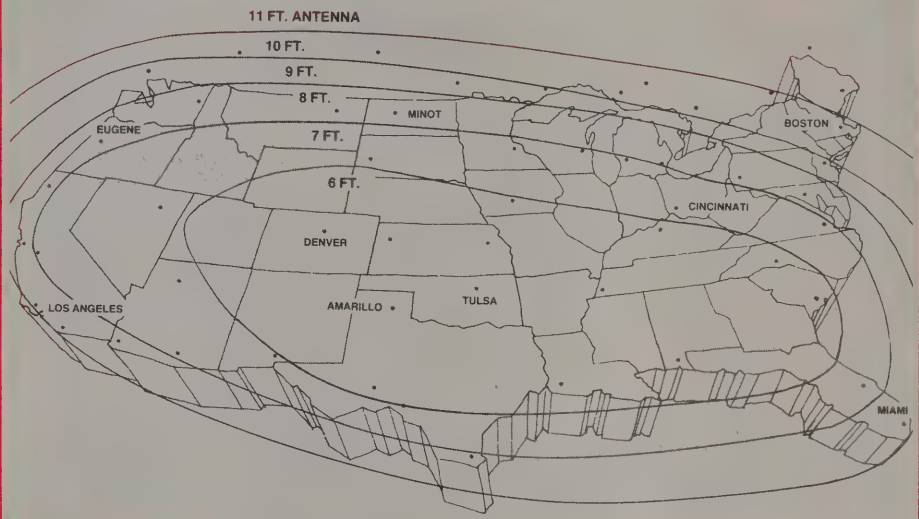
If you have a situation that limits the size of antenna you can install (such as a very small backyard or local zoning regulations), the contour maps enclosed in this article will enable you to determine just how poor your reception will be on the weaker satellites.

As a rule of thumb, if the contour map indicates an eight-foot diameter antenna for a particular satellite in your location and you choose an antenna one size smaller (for instance, a seven-foot diameter antenna), you can expect to see light to medium sparklies or impulse noise. The video quality should still be very watchable and acceptable to most viewers; however, you may experience sparklies on saturated colors and even a buzz in the audio at times. As you reduce antenna size, remember that the performance drops faster at the lower end of the antenna size range (5 foot to 8 foot diameter) than it does with the larger antennas (9 foot to 12 foot dishes). For instance, if your location calls for a 12 foot antenna and you decide to use an 11 foot model, the performance degradation will be far less severe than a situation calling for a 7 foot antenna in which you use a 6 foot antenna.

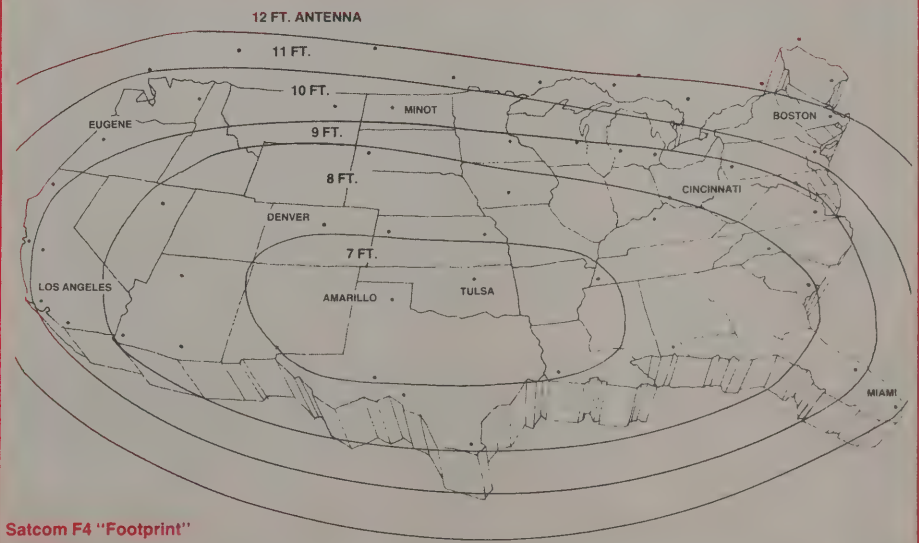
The reason for this is quite simple. Antenna performance is primarily determined by surface area and the percentage decrease changing from a 12 to 11 foot antenna is far less than the percentage decrease experienced between a 7 and a 6 foot. The following chart illustrates this.

Basic System (Not Including Installation)

Antenna Size & Type	Price	(% Increase)
6 foot diameter (solid reflector)	$1395.00	
7 foot diameter (solid reflector)	$1495.00	(7 %)
8 foot diameter (solid or mesh)	$1595.00	(6.5%)
9 foot diameter (solid or mesh)	$1790.00	(12%)
10 foot diameter (solid or mesh)	$2075.00	(16%)
12 foot diameter (solid or mesh)	$2490.00	(20%)

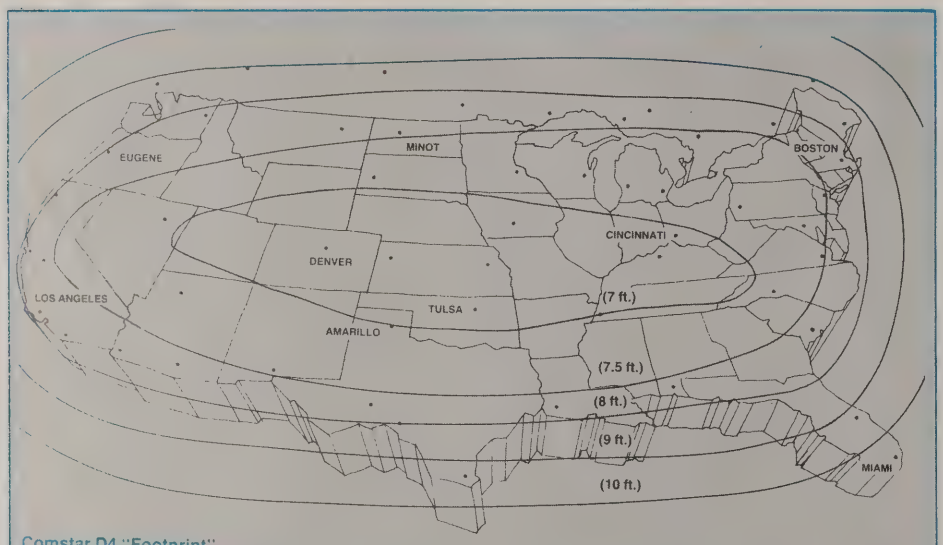


Satcom F4 "Footprint"
High Power

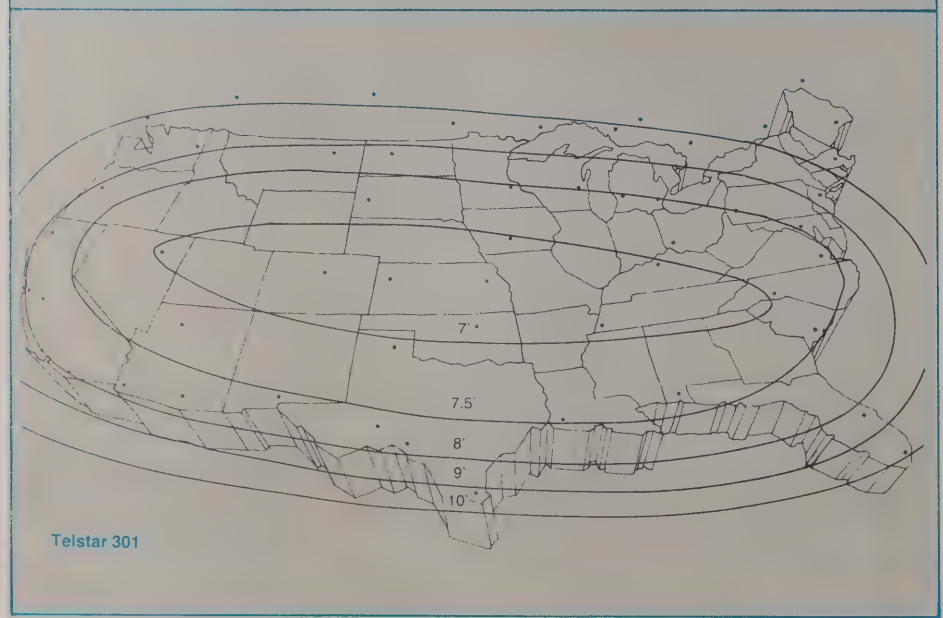


Satcom F4 "Footprint"
Low Power

Antenna Diameter	Gain* (*at 55% efficiency)	Square Area	Reduction In Area
12 sq. feet	41.1 dB	113 sq. feet	—
11 sq. feet	40.2 dB	95 sq. feet	16 %
10 sq. feet	39.4 dB	78.5 sq. feet	17.5%
9 sq. feet	38.95 dB	63.5 sq. feet	19 %
8 sq. feet	37.35 dB	50 sq. feet	21.5 %
7 sq. feet	36.3 dB	38.5 sq. feet	23 %
6 sq. feet	35.0 dB	28.2 sq. feet	27 %
5 sq. feet	33.4 dB	19.6 sq. feet	30.5 %



Comstar D4 "Footprint"
* This satellite no longer active.



Telstar 301

Since the Can-Am Road Trip was completed, a few new satellites and transponders have been activated and we obviously do not have the data for these newer services. Fortunately, most of these new transponders have higher power output than their predecessors and are unlikely to be the weakest services available via satellite. Morelos I, which is a Mexican satellite, is an exception and has an extremely weak footprint in the US. It would take an inordinately large antenna to receive sparklie-free pictures from Morelos I in most parts of the US and is not a practical consideration for most home satellite viewers.

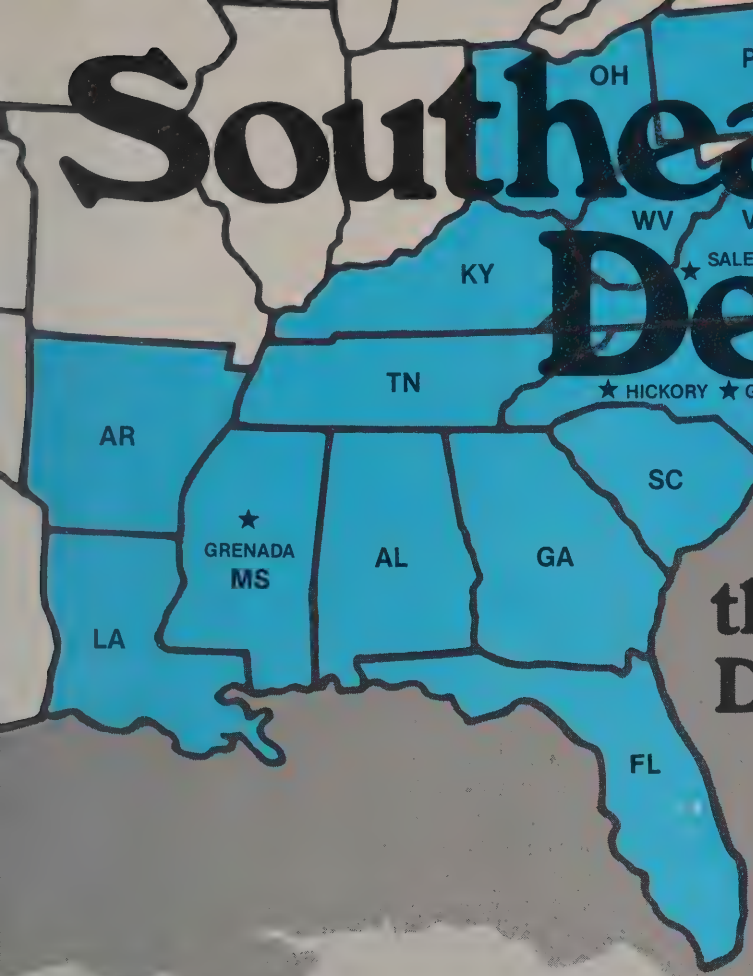
It would take an inordinately large antenna to receive sparklie-free pictures from Morelos I in most parts of the US and is not a practical consideration for most home satellite viewers.

When determining what size of antenna to use for your location, remember the following guidelines:

1. The antenna is the most important consideration in determining the performance of your home satellite system.
2. Antenna performance is directly related to size.
3. Big is Better!

(S) (T) (V)

Southeastern Dealers...



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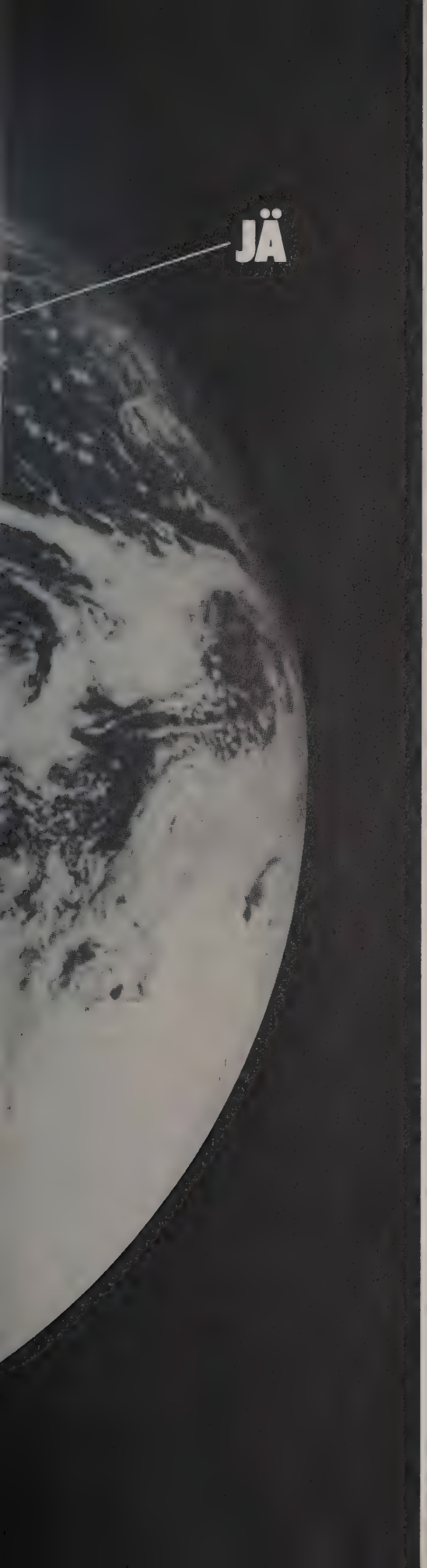

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Luxor has been Ku ready long before the rest of the world ever heard of satellite television.

Then came the eighties when we introduced America to its first Ku and C-band block receiver: Luxor's 9570 Mark II.

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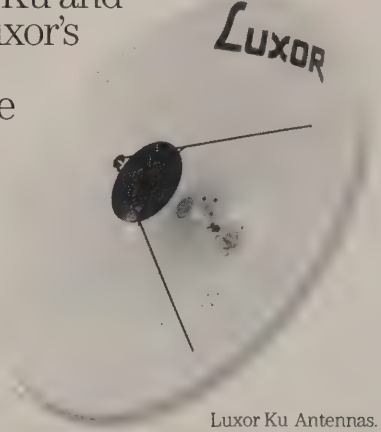

Luxor Ku Antennas.

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9570 Mark II Block Receiver.

9900 Block Receiver.

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The birthplace of Satellite Television.

Satellite Earth Station Day

by Courtland G. Newton, Jr.

THE WHITE HOUSE

WASHINGTON

October 28, 1985

I am pleased to welcome the representatives of the satellite television industry to our Nation's Capital for ''Satellite Earth Station Day.'' The rapid increase in the number of satellite earth stations across the country and their use for direct broadcasting is a reflection of America's ingenuity and know-how.

Founded in rural areas and nurtured by the American entrepreneurial spirit, earth satellite technology provides millions of our people with increased access to information, culture, and entertainment. The continued growth of your industry is a healthy indicator of the soundness of our economic system.

Nancy joins me in welcoming you to Washington for this special occasion. You have our best wishes for a great day. God bless you.

Ronald Reagan

"U.S. politics will never be the same if Americans truly understand what happened on 'Satellite Earth Station Day' in Washington," says Robert Behar, technical coordinator of SPACE's unique event held October 29 in the nation's capital. "In less than three weeks, a handful of small businessmen and electronics dealers put together one of the most dramatic and unusual educational and lobbying efforts in American political history. One day soon, the significance of what happened there will dawn on some of the astute political minds in this country."

Satellite Earth Station Day was sponsored by SPACE, the Satellite Television Industry Association. It was billed as a first birthday celebration of President Reagan's signing of section 705(b) of the Cable Communications Policy Act of 1984, which affirmed satellite dish owners' legal rights to receive unscrambled cable TV programs by satellite. The event was highlighted by the display of more than 200 satellite antennas on the capital mall. But Behar believes it should be appreciated as much more than a highly visible publicity stunt.

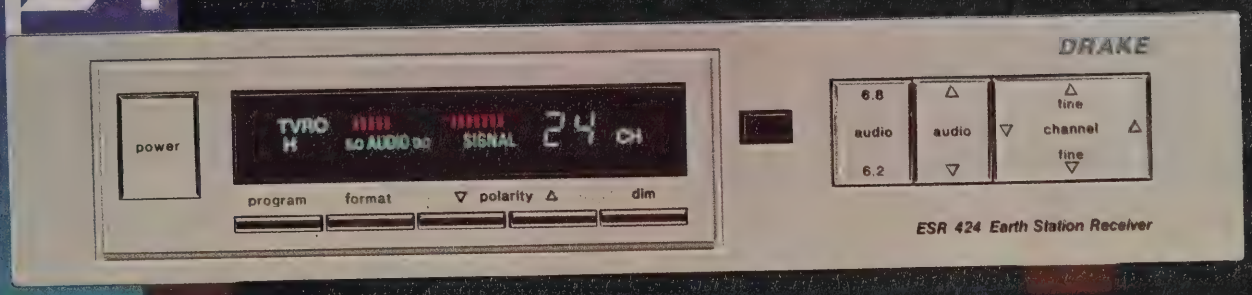
What was so unusual about Earth Station Day in Washington? For one thing, it was the first time a political constituency—in this case, the makers, sellers, and owners of home satellite TV systems—ever lobbied in Washington by establishing its own temporary national satellite television network to help get its story across. For another, it was an example of how a diverse group of manufacturers, distributors, dealers, and trade press in an infant industry could mobilize a national education and lobbying effort in record time. And the entire event was marked by a remarkable degree of cooperation between diverse elements of an industry.

Satellite Earth Station Day was the brain child of SPACE; its legal counsel, Brown and Finn; and various industry leaders. It was Bob Behar who suggested the idea of a nationwide satellite broadcast. The goal was to help owners and users of earth stations to learn about SPACE, its activities on behalf of its members and the satellite TV system industry, and the major issues confronting home satellite system makers, sellers, and users. SPACE decided to use members of the satellite TV industry trade media as its TV reporters and field producers. This had the effect of bringing them into a close working relationship for a common cause—in contrast to what is normally a competitive posture for some.

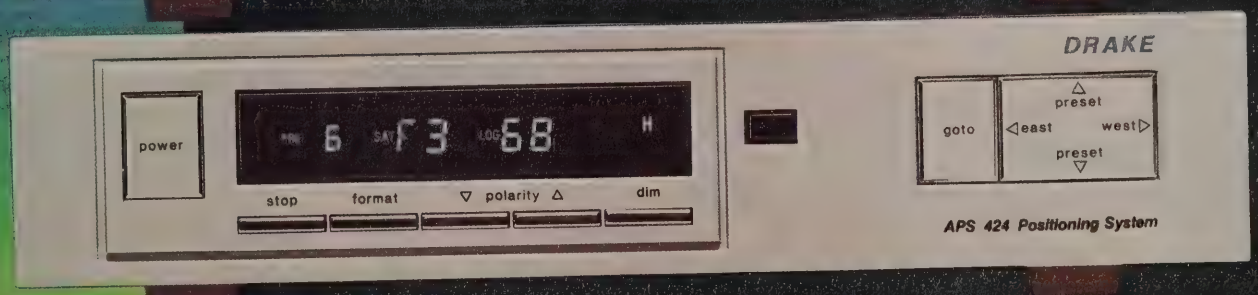
The initial concept was to limit broadcasting to three to five hours of live television coverage of events, in view of the costs involved, the logistical

...two for the show.

ESR 424 EARTH STATION RECEIVER

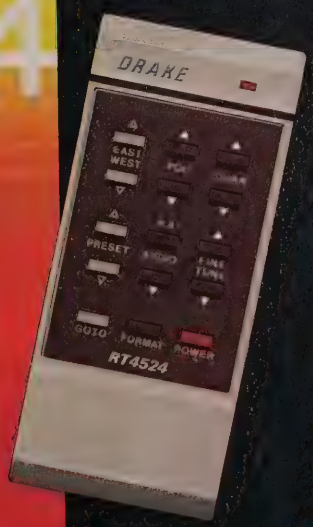


ESR 424 Earth Station Receiver



APS 424 Positioning System

APS 424 ANTENNA POSITIONING SYSTEM



An entertainment team that is second to none: the Drake ESR424 Home Satellite TV Receiver and APS424 Programmable Antenna Positioning System.

The ESR424 receiver offers you the choice of either economical single conversion or convenient block down conversion. Both models feature the solid dependability of microprocessor design. With the easy-to-use infrared remote control, the Drake ESR424 is a natural for any home satellite TV system. Extra features like audio channel seeking and an innovative fluorescent display combine for unbeatable viewing pleasure!

The APS424 programmable antenna positioning system charts a new course in control technology. Simple programming allows easy entry and selection of satellites. A one-button command will move your antenna to the desired position through the dependable power of the APS424 motor drive. The APS424 is also controlled by the same infrared remote used with the Drake ESR424 Receiver!

DRAKE

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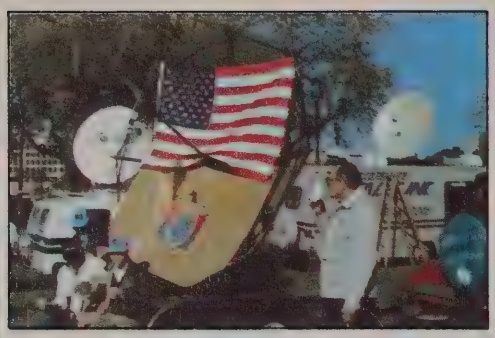


challenges,, and the short amount of time available to plan and prepare. "But the idea grew and grew and grew," says Behar, until SPACE found itself committing for a total 14½ hours of TV broadcast time from 8:30 am to 11 pm over Galaxy 3, transponder 5.

Planning and logistics for Congressional relations was coordinated by SPACE and Brown and Finn. Responsibility for Satellite Earth Station Day broadcast programming, engineering, facilities, and production as well as uplinking the TV signal to the satellite fell to Bob Behar. Behar is a former TV broadcast engineer and now the president of Hero Communications, a leading satellite TV antenna designer and manufacturer. He has made several trips around the globe designing, engineering, and installing some of the world's most sophisticated private satellite TV reception systems.

To pull the entire event together, SPACE, Brown and Finn, and Behar and his broadcast team found it necessary to coordinate with officials of the National Park Service, Washington, D.C. police, and the Capitol police, as well as congressional security personnel. Without their cooperation and the waiving of certain special rules, the event would not have been possible. The tedious and painstaking task of actually walking the permit applications through the appropriate jurisdictions was handled by Hal Hailey of Davis Antenna Service of Washington, D.C., and by Derek Humphreys of Brown and Finn.

The entire broadcast was live. Initially, there was concern that SPACE's broadcast team would have trouble sustaining live programming for the entire day. Therefore, pre-taped material was available on standby—including some technical tapes by Bob Cooper, a number of 15-minute tapes on Satellite Earth Station Day, and interviews with congressional leaders. However, SPACE's broadcast operations went so smoothly that only 20 minutes of tape was used. The interview schedule at six locations flowed so well that the schedule actually got backed on several occasions, Behar says.

SPACE's broadcast capability consisted of six remote TV broadcasting sites throughout D.C., linked by microwave. Two remote sites were set up in the Russell Senate Office Building and the Rayburn House Office Building. Two outside locations were established on the Capitol building steps, one on the senate side and one on the house side. A fifth remote broadcast unit was set up on SPACE's main stage on the mall in front of the Capitol building. The main control anchor studio was situated in a big tent in front of the mall.

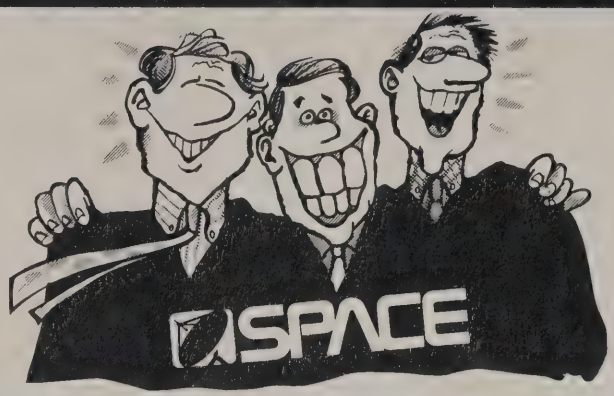
SPACE rented all necessary equipment, including 10 color TV cameras, 18 professional microphones, 25 walkie talkies, a 100' by 300' hospitality tent, two smaller tents which served as a broadcast studio and kitchen, chairs, typewriters, and telephones. A 40-foot tractor trailer for use as a studio control van was rented from PCS Productions, Pittsburgh. Specially-trained technical personnel were hired locally and brought in from Miami and Philadelphia. It also leased satellite transponder time, plus telephone lines to each remote sight.

Behar's ad hoc broadcast management team included a station manager and a field producer in each of

Dealers Wanted to Qualify for SPACE Certification

You can't afford not to be among the ranks of SPACE certified dealers!

- Prepare yourself—some packagers of scrambled programs for sale to home satellite antenna owners have indicated that they will require SPACE certified dealers to sell their product.
- Demonstrate to your state licensing agency that a national education program has been established and that you have completed its requirements.
- Increase your knowledge of the satellite television business.
- Distinguish yourself from "fly-by-night" dealers with decals, logos, press releases, certificates, and plaques provided by SPACE.
- Earn college credits.



Classes are available at major trade shows and now on satellite television!

Upcoming Classes

January Downlink
January 24, 1986 — Antennas for Satellite Reception
January 25, 1986 — Terrestrial Interference
January 26, 1986 — Troubleshooting the Satellite Reception System

SPACE/STTI Las Vegas Convention
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February 21, 1986 — Satellite Antenna Installations

Classes are downlinked every January, April, July & October

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6200 Roosevelt Blvd.
Philadelphia, PA 19149
215/743-5777

Satellite Video Services
317 East Pleasant Valley Road
Altoona, PA 16602
814/942-5003

Sun Satellite Systems
1341 Cumberland Street
Lebanon, PA 17042
717/272-2064

SOUTH DAKOTA
Warren Supply
300 E. 50th Street, North
Sioux Falls, SD 57101
605/336-1830

TENNESSEE
Echosphere
10536 Lexington Drive
Knoxville, TN 37922
615/966-4114

TEXAS
Echosphere
3901 LaReunion Pkwy-Bldg. 15
Dallas, TX 75212
214/630-8625

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800/558-5582

$75
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Classes will be downlinked every January, April, July and October.

Classes are also available at all SPACE/STTI trade shows.

SPACE
The Satellite Television Industry Association, Inc.
300 North Washington Street
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Alexandria, Virginia 22314

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Miami, FL 33126-2929
(305)262-7676
Sat Star
1395 Marietta Parkway, Building 700
Marietta, GA 30067
(404)425-9385
California Amplifier, Inc.
3481 Old Conejo Rd.
Newbury Park, CA 91320
(805)499-8535
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Hawthorne, NY 10532
(914)347-4040
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2360 Bering Drive
San Jose, CA 95131
(408)262-2536
STV Magazine
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Shelby, NC 28151-2384
(704)482-9673
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Huntington Beach, CA 92649
(714)898-0576
Raydx Satellite Systems, LTD.
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Ocala, FL 32678-4078
(904)687-2003
Hero Communications
2470 West 8th Avenue
Hialeah, FL 33010
(305)887-3203
UP Superior Satellite Dish Mfg.
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Escanaba, MI 49829
(906)789-1027
Echosphere Corporation
1925 Dartmouth Avenue
Englewood, CO 80110
(303)761-4782

STTI
Box G
Arcadia, OK 73007
(405)396-2574
ESP, Inc.
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Lexington, KY 40503
(606)278-1209
Vidare/Div. of AFP
P.O. Box Q
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(501)327-6591
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Rogers, AR 72756
(501)327-2200
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600 108th Ave. NE Suite 539
Bellevue, WA 98004
(206)451-4414
STS
2310-12 Millpark Dr.
St. Louis, MO 63043
(314)423-5560
Regency Electronics
7707 Records Street
Indianapolis, IN 46226
(317)545-4281
Wilson Microwave Systems
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Henderson, NV 89015
(702)458-0144
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Compton, CA 90220
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Travelers Rest, SC 29690
(803)834-7765
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(417)624-4061

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Redding, CA 96002
(916)365-9131
United Satellite Systems (USS)
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St. Hilaire, MN 56745
(218)681-5616
Janeil Corporation
6850 Canby Ave., Suite 106
Reseda, CA 91335
(213)881-4155
Birdview Satellite Comm., Inc.
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Olathe, KS 66062
(913)829-0400
Gensat Communications Corp.
951 Alness
Downsview, Ontario, CN M3J 2J1
(416)736-4555
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29 Hammit Lane
Salem, VA 24153
(703)387-0062
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Rt. 2, Georgetown Road
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(614)439-2561
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(615)354-2999
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(919)934-9711
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Big Spring, TX 79721
(915)263-1281

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(501)882-6485
Seabreeze Antenna Technology
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Bonnieville, KY 42713
(502)531-1531
R.L. Drake Company
P.O. Box 112
Miamisburg, OH 45342
(513)866-2421
Kenwood USA Corp.
1315 E. Watson Center Rd.
Carson, CA 90745
(213)578-1700
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Houston, TX 77036
(713)784-8953
Astro Industries
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Solon, OH 44139
(216)248-5656
Tee-Com Electronics, Inc.
8116 Montview Road
T.M.R. Montreal, Quebec, CN H4P 2L7
(514)342-3550
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Mamou, LA 70554
(318)468-2203
Antenna Dev. and Mfg., Inc. (ADM)
Hwy 67 South, P.O. Box 1178
Poplar Bluff, MO 63901
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On behalf of the satellite industry, we extend thanks to these Corporate Sponsors For Satellite Earth Station Day.

the six broadcast locations, two videotape operators, two audio men, a Chyron operator to handle subtitles, a TV technical director, and an assistant director. Behar, his co-producer, Hal Hailey, and his crew monitored all six broadcast sites and coordinated the interview lineup throughout the 14½ hour period. This required careful juggling of ongoing interviews in order to keep live material on the air while insuring that no important interview opportunities were missed.

Food was catered for members of Congress and their representatives and satellite television system equipment was on display at all six of the broadcast sites to help educate the legislators and their staffs about the workings of satellite TV. Live satellite television systems were continuously demonstrated in the Russell Caucus Room, the Rayburn Foyer, and at the rear of the Capitol.

SPACE's broadcast time flowed extremely well, according to viewers as well as observers at the broadcast sites. Operations were facilitated by the careful planning, the 25 walkie talkies, and the use of Georgetown University students who provided extra arms and legs to guide SPACE members to Congressional offices; bring Congressmen, Senators, and staff members to the broadcast sites; and serve in orther coordinating functions. They also helped assemble 3,000 press information kits for distribution to Congressional offices and to the news media.

Anchor men for the early hours of broadcast were Taylor Howard, chairman of SPACE; Bob Cooper, editor of Coop's Satellite Digest; and Rick Brown of SPACE's law firm, Brown and Finn. Most of the morning broadcast time was devoted to coverage of SPACE's rally on the Capitol mall and its subsequent press conference.

The afternoon anchor persons were Chuck Hewitt, executive vice president of SPACE; Robyn Nietert of Brown and Finn; and Joe Boyle, SPACE's vice president for communications.

Members of the industry trade press were assigned to specific broadcast locations throughout the day. Many of the interviews they conducted were planned carefully in advance in cooperation with Congressional staff. These included many of the main speakers at the morning rally. Others were handled on a random basis as newsmakers came on the scene, including a 15-minute interview with Senator Barry Goldwater of Arizona.

Congressmen, senators, and their staff members were not the only people interviewed. The list of TV guests included satellite TV manufacturers, distributors, dealers from many parts of the U.S.—including members of the SPACE dealer board—and many satellite system owners.

Members of the industry trade press who served as TV interviewers included Dr. Ed Meek, publisher of Satellite TV Opportunities Magazine; Chris Schultheiss, editor and publisher of STV Magazine; John Ponce, editor of Satellite TV Week; Lloyd Covens, editor of Channel Guide; Bruce Kinnaird,

See **Satellite Earth Station Day** on page 88

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J

This Month's Feature

Satellite TV Product Review Book

Contains STV's Product Reviews on more than 20 receivers (including the Chaparral Sierra, USS Maspro, Luxor 9900, and Uniden), plus a comparison chart showing how the receivers rate on video S/N ratio, IF noise bandwidth, audio frequency response, etc. Also included are Receiver Test Data and Consumer Data Sheets on each product. This is a must for anyone planning to purchase a receiver. **Price: $5.95.** To receive this month's feature, circle **J** on the order form.

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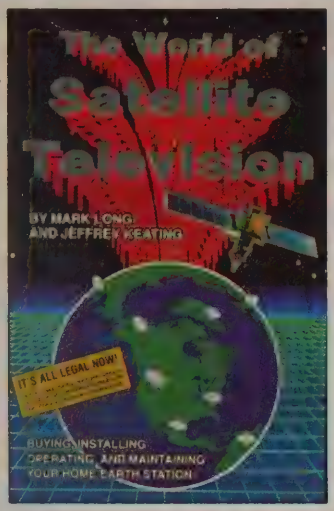
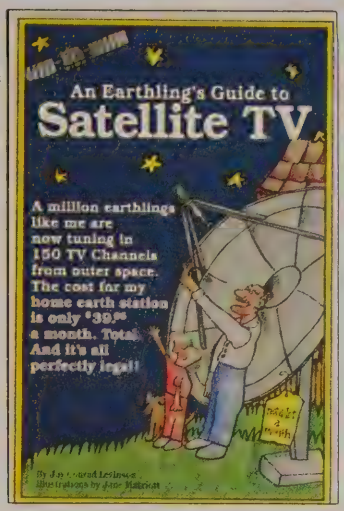

The World of Satellite Television
BY MARK LONG AND JEFFREY KEATING
IT'S ALL LEGAL NOW!
BUYING, INSTALLING, OPERATING, AND MAINTAINING YOUR HOME EARTH STATION

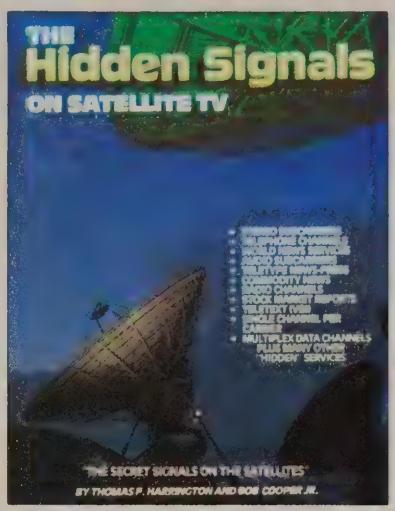
The World of Satellite TV. The all time best seller. This book has become standard reference for home satellite TV enthusiasts. Taking the reader through the intricacies of satellite TV reception, The World of Satellite TV is a valuable addition to the home satellite library. **$10.95**

B


An Earthling's Guide to Satellite TV
A million earthlings like me are now tuning in 150 TV Channels from outer space. The cost for my home earth station is only $39.95 a month. Total. And it's all perfectly legal!

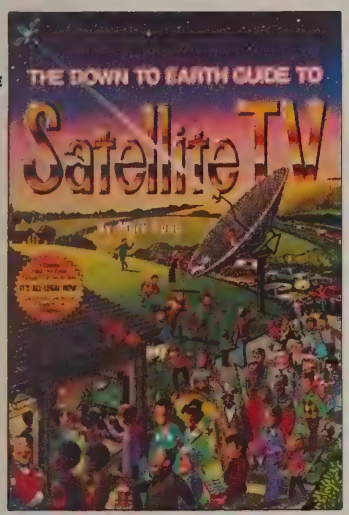
An Earthling's Guide To Satellite TV. A whimsical look at the ins and outs of home satellite reception. Witty and entertaining An Earthling's Guide gives good insight into the workings of a home satellite system. **$5.95**

C



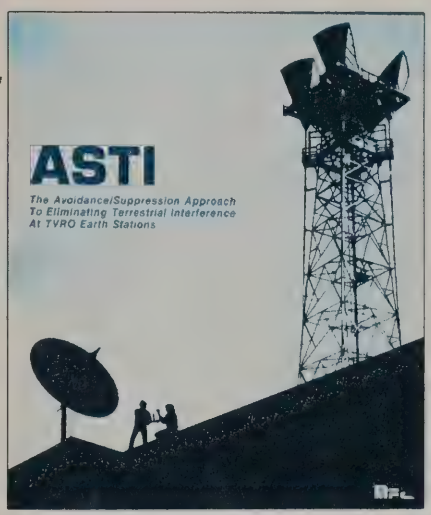
The Hidden Signals on Satellite TV. There are many publications available for the video services on satellites but only one that explains the hundreds of audio and data services. This book tells you how to receive them and where to find them. 175 pages of the "hidden signals." **$14.95**

E



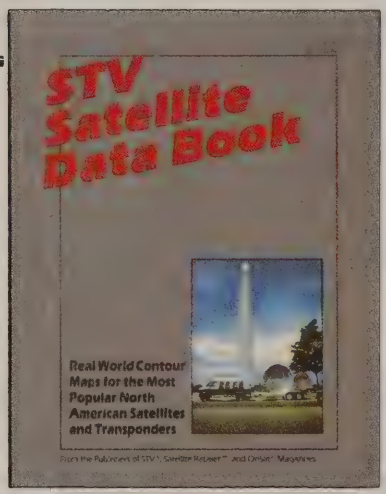
The Down To Earth Guide To Satellite TV. Everyone in your family should understand the basics of operating a home satellite system. This book is a "road map" of the satellite superhighways including a complete glossary of terms written in easy to understand language. **$7.95**

F



The Avoidance Suppression Approach To Eliminating Terrestrial Interference. This is the definitive text covering the complex field of terrestrial microwave interference and its effects upon satellite receiving systems. Written by Glyn Bostick of Microwave Filter, the ASTI book takes the installer step by step through the procedures necessary to combat terrestrial interference. **$59.00**

G



STV® Satellite Data Book. The only publication of its kind in the world. Real world measurements of the satellite signals' strength taken during **STV® Can-Am Road Trip.** Contour maps for most of the North American satellites and signal strength levels on a transponder by transponder basis are included in this 200 plus page book. **$19.95**

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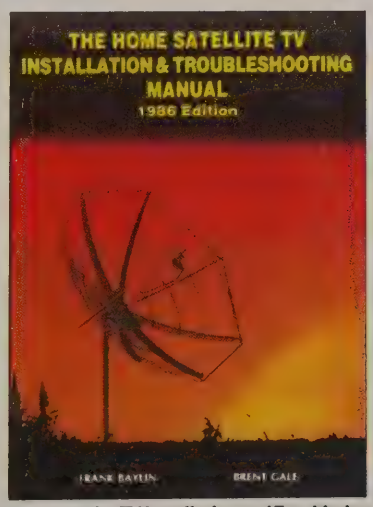

The Home Satellite TV Installation and Troubleshooting Manual—1986 Edition. This 330 page text explains how the satellites operate and provides all the information necessary for selecting and installing a satellite system, multiple receiver and television hookups, as well as details for troubleshooting any system on the market. **$29.95**

I

Dish It Out! Through the use of 200 multiple choice/true-false questions and a gameboard, players are introduced to the world of satellite TV. The game is an invaluable aid for prospective or new TVRO owners, and would make a great gift from dealers to new customers. **$12.95**

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Royal Sat has inherited all the best traits from its parent company, Daewoo. Leadership. Stability. And a global perspective.

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All members of the Royal Sat distribution network believe in this future. It's about time you did too.

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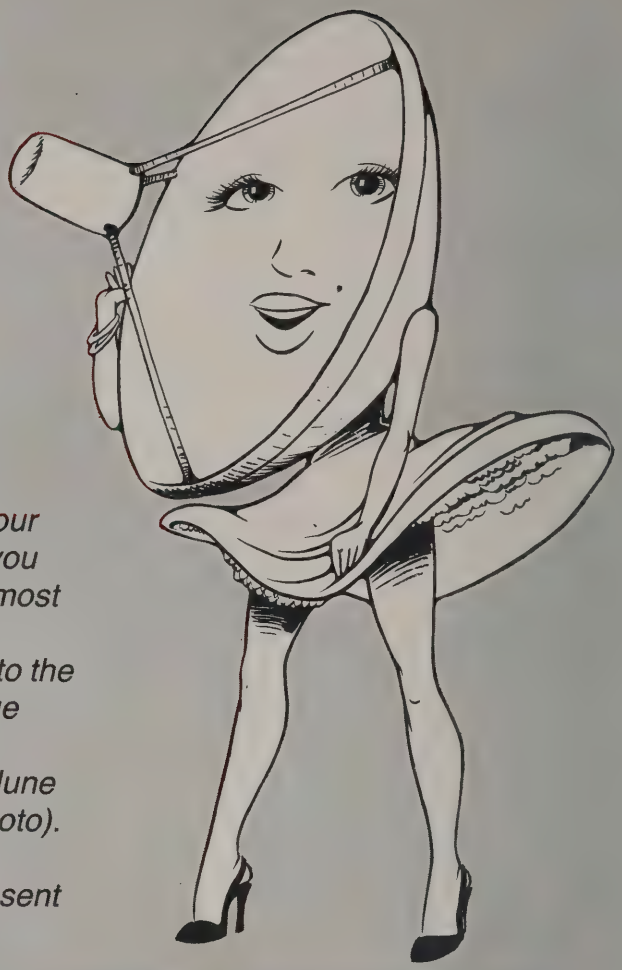
FROM TOP: BR-300 blockdown conversion system with remote control; BR-200 Blockdown conversion system; SR-120 single conversion unit.

"I'm A Beautiful Dish" Photography Contest



Yes, you read it correctly. STV is proud to announce our first "I'M A BEAUTIFUL DISH" Photography Contest. If you have been bragging to everyone about how you have the most beautiful dish in America, now's the time to prove it. This contest is exclusively for STV readers. First prize will go to the person whose photo shows a dish in the most picturesque surrounding. The winner will receive $125 plus an "I'M A BEAUTIFUL DISH" T-shirt. This photo will appear on the June 1986 cover of STV (or a later issue, depending on the photo).

The next 25 winning photos will receive a one-year subscription to STV (or a one-year extension on their present subscription), and an "I'M A BEAUTIFUL DISH" T-shirt.

"I'M A BEAUTIFUL DISH" Photography Contest Rules:

1) Please submit your 35mm or larger COLOR photo (and accompanying negative) or slide.
2) All submitted photos become the property of Triple D Publishing and will not be returned.
3) Please DO NOT WRITE on the back of the photo.
4) Vertical shots are preferred (but not required).
5) Your photo must be in our office no later than March 31, 1986.
6) We would like to emphasize scenery in these photos. Please refrain from using people in photograph.
7) Winners will be listed in the June 1986 issue of STV.
8) Limit one photo entry per person.

Now we can settle, once and for all, who really does have the "Most Beautiful Dish" in America. Good luck to all, and remember to put film in your camera!!!

"I'm A Beautiful Dish" Contest

Enclosed is a photo/slide of my Beautiful Dish. I wish to enter it in STV's "I'm A Beautiful Dish" contest. I agree that by signing this, I am releasing all rights to this photo.

Name _____ (PLEASE PRINT) Telephone Number ( )_____

Address _____ (STREET) (CITY) (STATE) (ZIP)

Shirt size (circle one)
S M L XL

Signature _____

"I'm A Beautiful Dish" Contest
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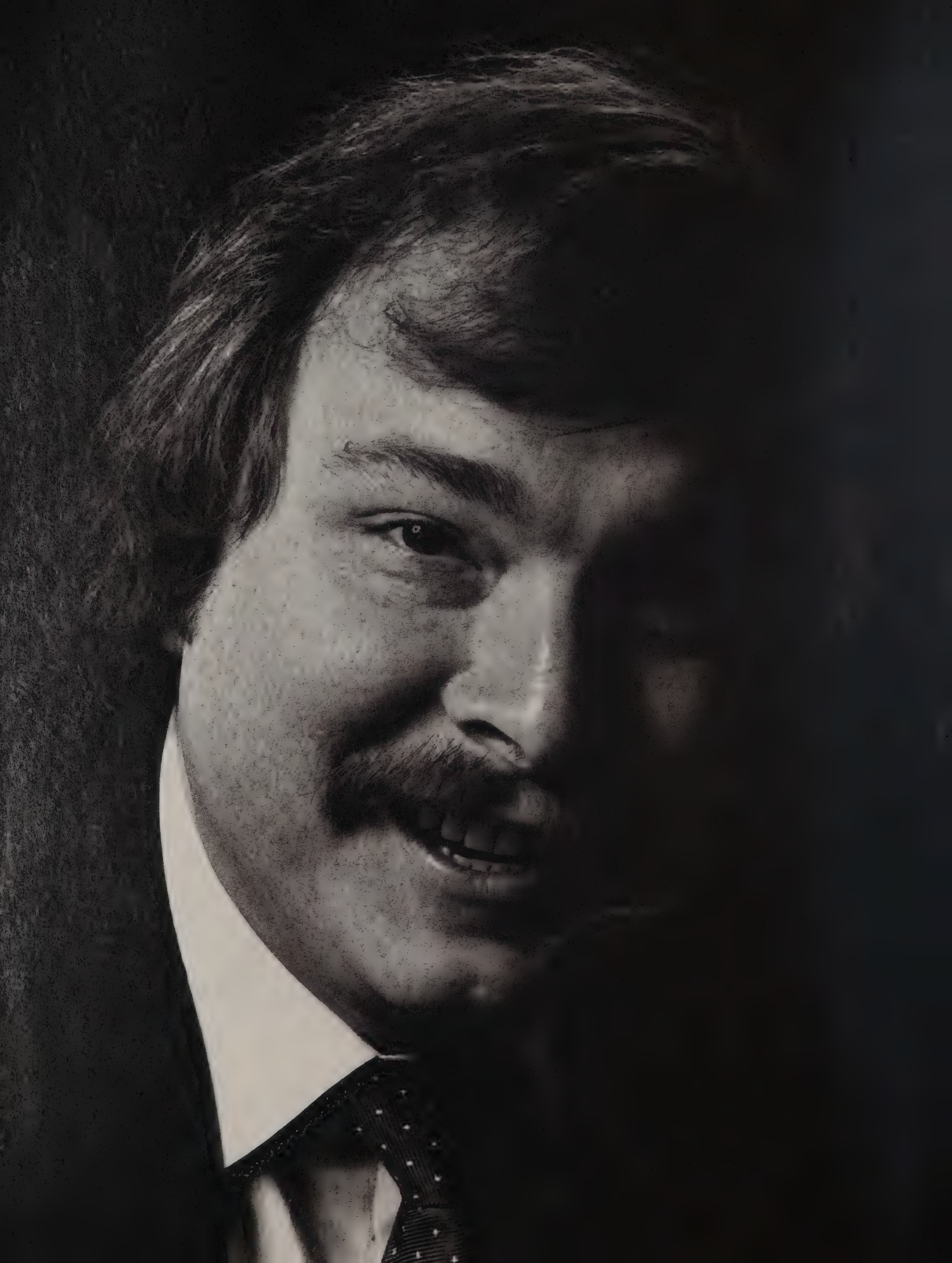

"My job is proving you can't fool Mother Nature."

Ed Horton
President

Meet the father of technology at STS.

Ed heads up the research and development side of our company.

Quite a challenge, considering he also supervises some of the brightest technical minds in the industry. Guys who have designed spacecraft and groundstation antennas for the Jet Propulsion Laboratory's Voyager, NASA's SkyLink and the Deep Space Network.

Ed's group continually strives to enhance the performance, reliability and value of STS products.

But not every idea is golden.

And that's where Ed shines.

He takes the best of those ideas and incorporates them into our products.

He checks to see if they can be done within the natural properties of electronics and the structured disciplines of the assembly line.

He makes sure STS products are as sophisticated as possible, while making them as simple to operate as possible.

His tenacity pays off in products such as the STS LSR,™ shown below. The first full-function frequency synthesized block receiver to include a built-in actuator.

The STS LSR lets you pre-set and store up to 54 satellite positions and move to any one at the touch of a button.

And a parental "censor" lockout lets you restrict or "step over" rarely watched channels or satellites.

There's fully-programmable audio. Full-function wireless remote control. Fast audio seek and scan. A TV/Satellite switch, an RF modulator, a polarity controller and a range of other advanced features that are built-in, not added on.

And it's features like these, by guys like ours, with a President like Ed, that make STS the fool-proof way to go.

STS™ Satellite Technology Services, Inc.
2310-12 Millpark Drive
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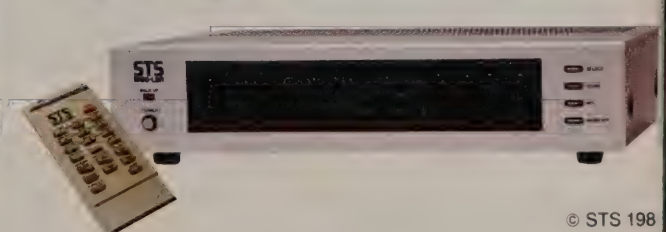
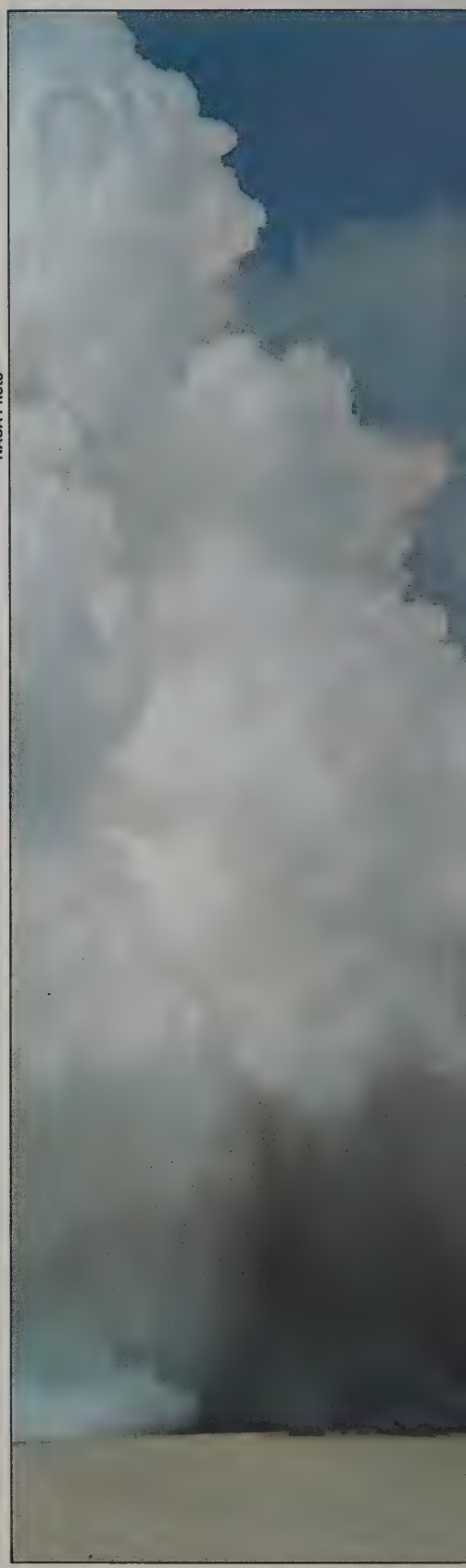


© STS 198

Nineteen eighty-five was a very successful launch year and, from all appearances, the coming year's activities will be even more spectacular. In this article Jim Tippins outlines the current 1986 launch schedule. Jim just happens to reside in the 'same neck of the woods' as the Kennedy Space Center.



NASA Photo

Launch Alert

by Jim Tippins

While 1985 was a busy year for launch activity, 1986 promises to be an even busier one. Nineteen eight-five brought a number of firsts: the first launch of Atlantis, the first space shuttle mission dedicated entirely to the Department of Defense (DOD), and the first eight member crew—the largest ever flown into space.

Nineteen eighty-six is promising to be just as exciting. The second pad at Complex 39 is activated and due to support a regular launch schedule. The Vandenberg Air Force Base pad is almost ready for use and should see a launch sometime this year. A new upper stage, the Centaur, will be launching along with the tried-and-true Inertial Upper Stage (IUS) and the Payload Assist Module (PAM). Westar will try again and the NASA Tracking and Data Relay Satellite (TDRS) will be placed into geosynchronous orbit. A number of expendable launch vehicles are also scheduled to carry payloads aloft. All in all, look for an active launch year ahead.

Understanding The Heading Abbreviations

There are four active orbiters in use in the Space Transportation System (STS). The orbiters and their vehicle numbers are as follows: Challenger (OV-099), Columbia (OV-102), Discovery (OV-103), and Atlantis (OV-104). Flight missions are often referenced in two ways: by STS number and by STS mission designation. The STS number is a sequential series flight assignment number that has been in use since the very first mission scheduled. However, due to mission slips and cancellations there have only been 24 missions flown to date. The next mission (and the first this year) is STS-33 (Mission #25). Vandenberg launches will use a similar

Atlantis lifts off the pad on Mission 51-J. This was the maiden mission for the newest addition to the Space Transportation System.

THE ONE.

SPACE VISION 4500 ANTENNA

Alas, Space Vision once again excites the satellite reception industry with a 10 foot Aluminum Mesh Antenna that exudes "total engineering". With features that show Space Vision's foresight and leadership to answer every category of performance and reliability. "THE ONE" answers only to you.

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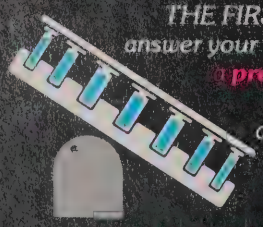
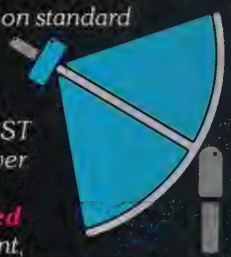
THE FIRST ONE to answer your needs with a ***pre-grooved hub unit*** *and unique overhanging lip design for added strength and* ***quick assembly.*** *Space Vision's ultra-modern extrusion forming machine guarantees constant curve accuracy within the most exacting tolerances. All parts of the 4500's reflector surface are made of the latest* ***"Space Age" aluminum*** *you've been hearing about, protected by the tested permanence of our own* ***"Weather Guard"*** *coating. Every piece of hardware is first quality corrosion resistant.*



The 4500's ***"deep dish"*** *configuration affords maximum illumination efficiency and minimum terrestrial interference on standard design feed horns.*

You even get THE FIRST ONE to deliver an innovative ***"Auto Focus" feed pole*** *to insure instant, precise no fault focal point positioning.*



SPECIFICATIONS:

Diameter	10 Ft.
F/D Ratio	.310
Focal Point	38.5"
Feed Type	Prime Focal
Gain	Approx. 40db
Mount	True Polar
Shipping Weight	125 Lbs.
Warranty	Limited 2 Yr.

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system; VLS will replace the STS number. The first Vandenberg launch will be VLS-1.

The mission designator is a bit more complex. Let's look at the Westar 6S launch as an example. Its STS number is STS-34. Its mission number is 61-E. The first digit is the last digit of the fiscal year. The fiscal year runs from October to October; we are currently in FY-86. The second digit is the launch site: 1 = KSC; 2 = VLS. And finally, the letter represents the serial flight in the fiscal year. Confused? You should have to work with the system. What happens if a mission slips? The STS number changes since it is sequencial, but the mission number stays the same. So you could have a fiscal year 85 launch in fiscal year 86—just like STS-33. It's mission number is 51-L!

How about a quiz? The first Vandenberg shuttle mission is scheduled to launch on March 20, 1986. What is its mission number? The answer is a few paragraphs away.

Current Space Shuttle Launch Schedule
January through May 1986

LAUNCH DATE/MISSION#	PAYLOAD	STS#/ORBITER#
22JAN/51L	Spartan-Halley/TDRS-B	33/099
6MAR/61E	Astro-1/Westar 6S	34/102
20MAR/62A	DOD	VLS-1/103
15MAY/61F	Ulysses	35/099
20MAY/61G	Galileo	36/104

More On The Missions...

Shuttle mission 51-L will deploy the Spartan-Halley experiment and TDRS-B. The Spartan-Halley's Comet experiment will be deployed from Challenger's payload bay to bring two ultraviolet spectrographs to bear on the coma and tail of Halley's Comet. The comet will be very close to the Sun and the observations will be the closest Sun/comet observations made to date. NASA's Tracking and Data Relay Satellite-B (TDRS-B) is also scheduled to be deployed on this mission.

Mission 61-E will carry Astro-1 in Columbia's bay and will deploy Westar 6S. The Astro-1 experiment is an ultraviolet (UV) astronomy telescope designed to obtain UV data on astronomical objects. Western Union's Westar 6S, replacement for the lost Westar 6, will be inserted into geosynchronous orbit. The 'S' in Westar 6S stands for substitute. The original flight manifest called for deployment of Westar 7, but I understand that Western Union wants to use the previously allocated slot for the current replacement vehicle. Thus, Westar 7 becomes Westar 6S. Presto!

Mission 62-A is the first Vandenberg Air Force Base launch of a space shuttle from Space Launch Complex Six (SLC-6). A beefed-up Discovery will be launched after extensive modifications to its airframe are completed at the Kennedy Space Center (KSC). The mission was classified the last time I checked, but keep an eye out for a declassification from Washington. The launch team is making a gallant effort to meet the projected date and I wish them a lot of luck...

Shuttle mission 61-F will deploy Ulysses from Challenger. At least it is scheduled to. Ulysses will fly on the Centaur, a high energy upper stage that will see its maiden flight on this mission. Centaur is currently involved in an aggressive schedule to meet that date and I think the right people are making it happen. The Ulysses mission will explore the Sun from a sun-centered polar orbit. It will also explore the interplanetary medium and the Jovian (Jupiter) atmosphere.

Mission 61-G will deploy Galileo. Galileo will continue the studies of the planet Jupiter and its satellite system, in part by sending a probe into Jupiter's swirling atmosphere. Galileo will be deployed from Atlantis' payload bay and will be injected into an interplanetary trajectory by a Centaur upper stage.

Back To The Mission Number....

Did you figure out the mission number for the first Vandenberg mission before you saw the answer in the launch schedule table? If so, great! You could easily work at the space center. If not, let's step through it a piece at a time.

First, the mission is scheduled to launch March 20, 1986. Since this is in fiscal year 86 (remember, October to October), the first digit is '6'. The second digit shows the launch site and Vandenberg will always be a '2'. So far, we have '62'. Since this is the first mission from SLC-6, it is the first serial mission or 'A'. Thus, the mission number for the first Vanderberg mission is 62A. And the second mission currently scheduled for Vandenberg this year is 62B.

Current Expendable Launch Vehicle Schedule

January through June 1986

There are only two expendable launches from the Eastern Test Range (ETR) during this time period—Atlas/Centaur-66 (AC-66) and Delta 178. Both will be launched from Cape Canaveral Air Force Station by NASA launch crews.

Mission AC-66 is tentatively scheduled to launch on April 24 from Complex 36. It will carry an FLTSATCOM satellite into orbit for the DOD.

Delta 178 is scheduled to launch on May 30 from Complex 17. It will carry the Geostationary Operational Environmental Satellite-G (GOES-G) aloft. The GOES-G satellite will provide continuous weather coverage of the western hemisphere.

Thinking Of Seeing A Launch?

You could come down to the area and try your hand at a parking place, but why work when you can play? Kennedy Space Center has a public affairs office that can set you up with parking permits (on a first come basis) to watch the launches on government property. All you have to do is answer a few questions.

When do you want to see a launch? The KSC public affairs office has a limited number of vehicle passes which allow the public to view a space shuttle from a designated site on Kennedy Space Center. Once you have picked the launch you wish to see, send them a postcard with your name and address at least six weeks prior to the launch date. You can even specify a particular location and it may be assigned to you.

The main area is on the NASA Causeway near the Banana River. You must use this area if you have an oversized vehicle such as an RV. If you have a regular passenger car, you can ask for a pass to the Static Test road viewing site. This is an excellent place to view the launch—complete with snack bar, grandstands, public address system, restrooms, and even a post office! These passes are limited, so it is best to get your requests in early.

If you have a large group (such as a civic organization in a chartered bus), you could be assigned to the best viewing site of all: The Schwartz road VIP viewing area! The KSC public affairs office even provides a tour guide if they grant you permission to enter this area.

In any case, don't sit ten miles away from the launch; get a pass! You are footing the bill, so take advantage of the great system that the KSC public affairs office has set up for your use. Write them at:

Visitors Service Branch
PA-VIC
Kennedy Space Center
Florida 32899

You can also request passes from the KSC public affairs office to view the unclassified expendable launches at Cape Canaveral Air Force Station. I don't think they sell souvenirs on the Cape side of the river, but the view from the grandstands is terrific!

The Only Thing That's Consistent Is The Weather...

These schedules are 'living'; that is, they are constantly under review. They have been known to change hourly when affected by orbiter or expendable vehicle problems. So don't bet your life on these dates or missions. Be sure and check with the Kennedy Space Center public affairs office for up-to-the-minute info. I'll update these schedules in the future and I'll also include information on payload and orbiter processing, as well as general interest launch news. In the meantime, tune in the NASA Contract Channel on your TVRO system!

Acronym List

DOD - Department of Defense
ETR - Eastern Test Range
IUS - Inertial Upper Stage
KSC - Kennedy Space Center
NASA - National Aeronautics and Space Administration
OV - Orbiter Vehicle
PAM - Payload Assist Module
SLC - Space Launch Complex (Pronounced SLICK; at VLS)
STS - Space Transportation System
TDRS - Tracking and Data Relay Satellite
VLS - Vandenberg Launch Site

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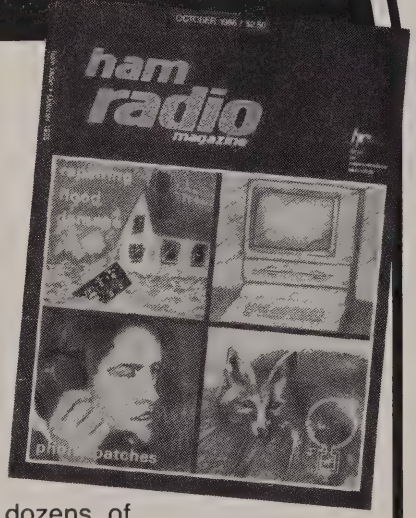

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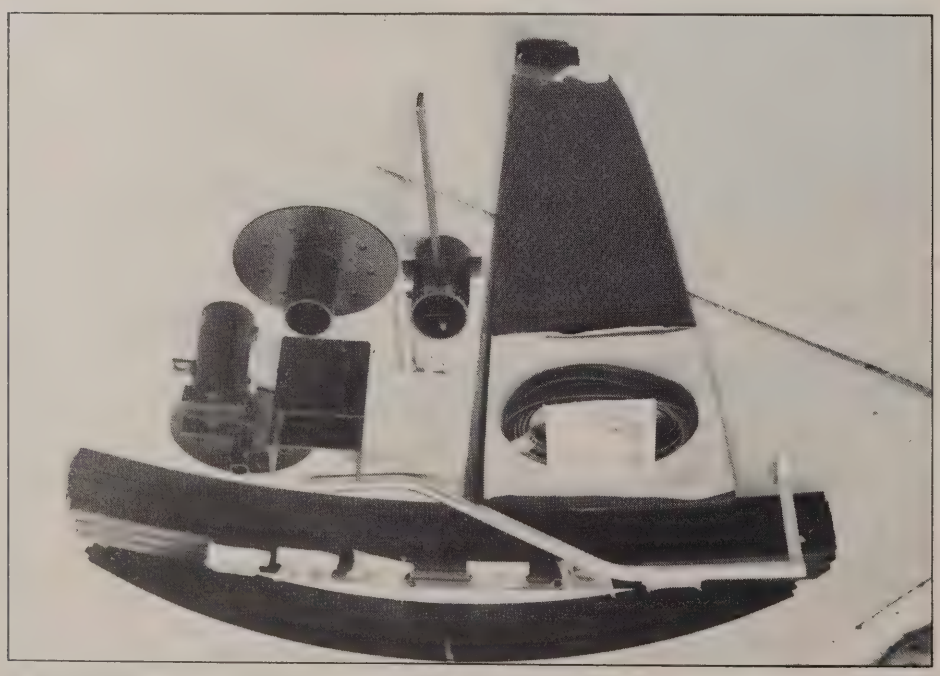
Product Review: The Orbitron 10' Mesh Antenna

by Mike L. Gustafson

The Orbitron ten foot antenna is manufactured in Spring Green, Wisconsin, by Greenbriar Products, Inc. Orbitron makes two sizes of antennas, a seven foot and a ten foot. The antennas are similarly constructed. The ten foot model is a prime focus design that can use most of the feedhorns currently on the market.

The Orbitron 10 is an 18 panel mesh style antenna with a designed focal point to diameter ratio, or f/D, of 0.30. Each of the 18 ribs that make up the mesh support structure are made out of extruded aluminum, which insures good adherence to the parabolic curve and allows for quick assembly. All of the ribs and mesh panels are anodized black aluminum—the current rage with mesh antennas. The mount is unique in how the polar off-set angle is set. Instead of a nut and bolt type of adjustment, which is pretty normal in this industry, Orbitron uses a single-hub tube that is welded on at a certain angle. There is a graduation read-out with a pointer attached to the hub and all you do is rotate the antenna on the hub to dial in the off-set angle. The rest of the polar mount is standard, including the 3.5 inch outside diameter pipe required to mount the whole antenna assembly.



The Orbitron 10 takes about 2 ½ hours to assemble.

The assembly of the antenna takes about 2 ½ hours the first time you try it. The polar mount is assembled first and installed on the pipe that is cemented into the ground. Next, the antenna is assembled up to the point of installing the mesh and then attached to the polar mount. Since the reflector spins on the mount tube, installing the mesh will be a lot easier and quicker with the reflector on the mount.

The center hubs are brought together with an intermediate hub plate sandwiched between them. Each rib is slid into the middle hub plate and between the front and rear hub plates. Next the rim is attached to the ribs and the whole assembly tightened down. After working your way around the rim of the antenna, joining the last rim flange to the first rim flange can be a little bit of a challenge for those weaker installers: this is your chance to play macho-man. I ate my Wheaties that morning so I had no trouble with this step!

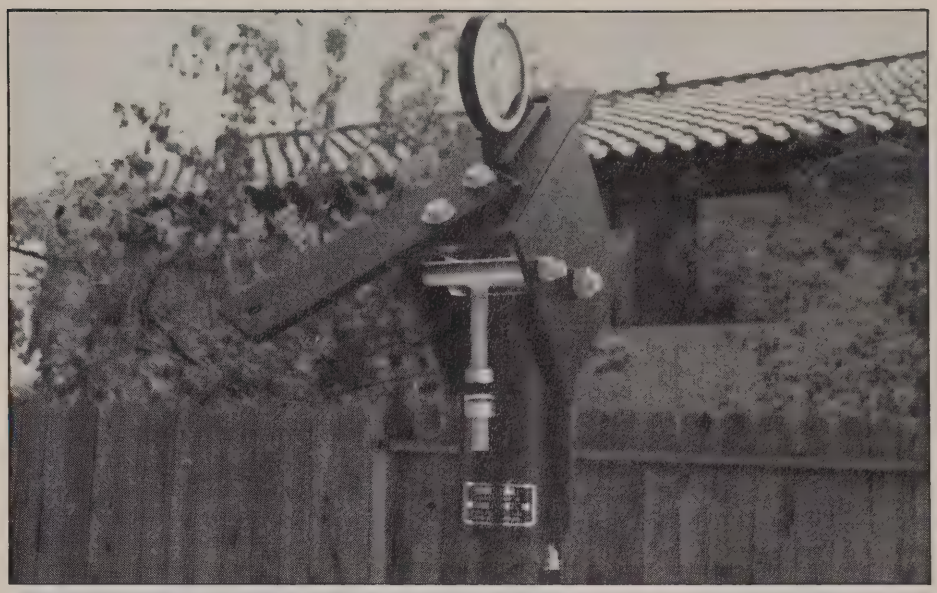
Once the reflector is up on the mount, you are ready to install the mesh. Each panel slides down the rib in a channel. The first couple of times you try this, the mesh will fight back, but the job gets a whole lot easier by the time the 18th panel slides in. One note of caution on installing the mesh—be sure to press

down on the mesh near the rim as you bend the mesh around the rim to install the trim. In some cases it is possible to cause the panel to arch up toward the rim and be a little flatter than it should be. If this point doesn't make sense at this time, just keep it in mind. When you get to that point in the assembly of the antenna, all will become clear. (So says the antenna swami.) After each panel is installed, the trim must be attached to the rim and over the edge of the mesh. If you don't take this step, each time the antenna is rotated to allow you to get at the next panel position, the last panel will slide out. Great for comic relief, but a real pain in the assembly.

Once the reflector is up on the mount, you are ready to install the mesh. Each panel slides down the rib in a channel. The first couple of times you try this, the mesh will fight back, but the job gets a whole lot easier by the time the 18th panel slides in.

Last, the buttonhook feedhorn support tube is installed. The tube is slid all the way down into the hub and bottomed out. The feedhorn with the gold ring is clamped to the buttonhook such that the nose of the feedhorn is 35 inches from the front hub plate. The instructions suggest that the focal point dimension should be 35 ¾ inches. I found that there was a 0.7 dB improvement in gain at my focal point number. I would suggest that you try both dimensions and see what works best for your antenna.

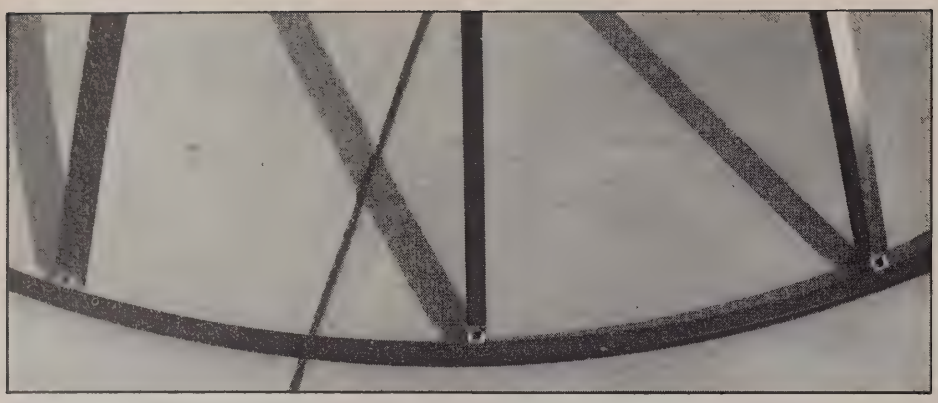
Once the antenna was up and running with the proper focal point set in, the performance of the final product was quite good. The antenna efficiency was measured at 64 percent and the antenna temperature was low, which created a good gain versus temperature (G/T) of 20.0 dB per degree Kelvin. Because the f/D was so low, the antenna pattern and sidelobe response was very good with



The polar mount is assembled first and then installed onto the pipe.

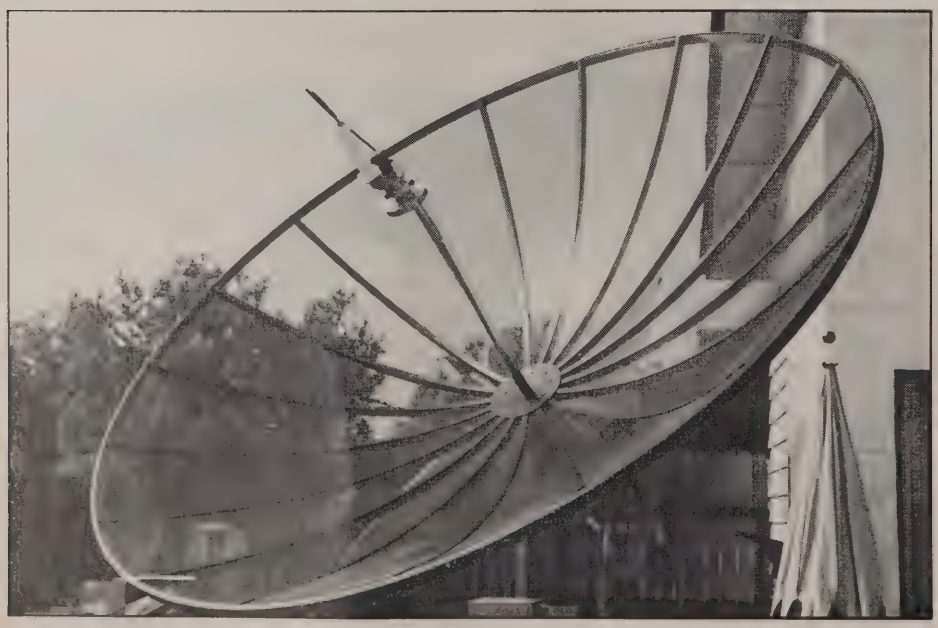
Kenwood is one of the many actuators that can be used with the Orbitron 10.

The 18 ribs are made of extruded aluminum which facilitates quick assembly.



The rim must be attached to the ribs before the mesh can be installed.

Attaching the trim to the rim holds the mesh panels in place.



The Orbitron 10 set up and ready to aim.

all sidelobes at −20 dBc or better. The beamwidth was consistent with a 64 percent efficiency ten foot reflector, so the Orbitron should have no problems operating in the closer satellite spacing environment.

In the area of subjective evaluation, I found that most all of the transponders on Satcom F3R were sparklie free. The only exception was transponder 8, which had some very slight noise in the picture. The mount was rather rigid, so it should be a good platform for a power drive. Tracking the antenna was easy and the only problem I noticed was that the pole mount uses only two bolts on one side of the mount to grip the pole. As I tightened them down, the whole antenna tended to tilt to one side, throwing the tracking off. I was able to compensate for this minor problem, but you should be aware of it when you build your Orbitron.

Things I Would Like To See Added Or Changed

During the assembly and test of the Orbitron 10, I noticed a few points that I would like to see changed. The first is that the assembly manual should include a chart that shows polar off-set angle and latitude so the first time installer can set that angle correctly. The mount is a little sloppy until all the bolts are tight. This adds a little fun to trying to track the satellite arc and then tightening down the bolts without moving the antenna mount. The holes punched in the front hub plate are a little big, so the carriage bolts tried to turn as the nuts were snugged down: it looks like the punch tool is a little worn. To install the

Once the antenna was up and running with the proper focal point set in, the performance of the final product was quite good. The antenna efficiency was measured at 64 percent and the antenna temperature was low, which created a good gain versus temperature (G/T) of 20.0 dB per degree Kelvin.

actuator requires too many washers and long bolts to take up the slack between where the actuator attaches to the base and the reflector. Finally, there are a lot of sharp edges around the reflector which could hurt anyone who bumped into it a little hard.

Things I Liked About The Orbitron 10 Foot Antenna

The first big plus with the Orbitron is its good performance in gain and sidelobe patterns. The whole structure is pleasing to the eye and should blend in with most areas, considering the black color and mesh design. Installers will love the easy to read assembly manual and the short assembly time. No special tools are required and most of the nuts are nylocks which means the nut will never back off due to vibrations. Last, the whole system is UPS shippable, which means low delivery costs and no strained backs from lifting heavy boxes.

At a time when there are more antenna companies springing up than you can shake a stick at, it is nice to find a product that has been well engineered in both performance and construction. The Orbitron 10 is a high performance, deep dish antenna that should provide good gain and terrestrial interference suppression, which is unusual for a mesh reflector. The antenna is well packed and seems to travel well from the factory—no torn boxes with parts spilling as the antenna travels to your door. If you are looking for a large antenna with good performance and good looks, then I can certainly suggest that you give the Orbitron 10 your serious consideration for purchase.

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The first big plus with the Orbitron is its good performance in gain and sidelobe patterns and installers will love the easy to read assembly manual and the short assembly time.

CONSUMER DATA SHEET
Orbitron 10 Foot Antenna

	Excellent	Good	Fair	Poor
AVERAGE CARRIER/NOISE IN dB (F3R)	(>12)	(10.1 - 12)	(8.1 - 10)	(<8.0)
ANTENNA EFFICIENCY	(>65%)	(60 - 65%)	(55 - 59%)	(<55%)
ANTENNA NOISE TEMP (Degrees K)	(<30°)	(31 - 45)°	(45 - 70)°	(>70°)
G/T (4.2 GHz & 75° K LNA) dB	(>22.0)	(19.1 - 22.0)	(15 - 19)	(<15.0)
BEAM WIDTH (3 dB) E-Plane (In Degrees)	(<1.3)	(1.3 - 2.0)	(2.1 - 2.6)	(>2.6)
SIDE LOBES LEVEL (dB)	(<19 dBc	(15 - 19.0)	(13 - 14.9)	(>12 dBc)
ANTENNA GAIN 2.0° OFF AXIS (dB)	(>20)	(17 - 20)	(12 - 16)	(<12)
CROSS POLARIZATION ISOLATION (dB)	(>22)	(19 - 22)	(16 - 18)	(<16 dBc)
MOUNTING ARRANGEMENT LNA COVER POWER DRIVE GEOMETRY				
CORROSION RESISTANCE				
ASSEMBLY MANUAL				
EASE OF ASSEMBLY				
ANTENNA INSTALLATION				
EASE OF SATELLITE TRACKING				
MOUNT STABILITY AND ADJUSTABILITY				
MOUNT STABILITY				

OVER-ALL SYSTEM SCORE

Excellent	Good	Fair	Poor

The Buyer's Guide: Tips To Make You A Better Consumer

Staff Report

It's a real jungle out there. Consumers are in a state of total bewilderment, and they don't know where to go or where to turn. "What?" you're probably asking. "Why all this mass confusion?" Well, it would appear that there is presently a deluge of satellite dealers in this country and the average person is having a hard time choosing between them.

Price is still not, according to the reports we have received, the number one top priority. Choosing the right dealer for you can literally dictate the amount of pleasure you receive from your system. In fact, owners who report having received good service from cooperative dealers seem to be the happiest with their purchase.

It would seem that experience is a valuable teacher, and there is much to be learned from the experiences of others.

We conducted a consumer survey to find out just how happy satellite dish owners are with their dealers and why. The responses we received were often quite informative.

First of all, you need to remember that satellite systems are not indestructible. They are basically hardware, and hardware does occasionally break down.

Perhaps that is why some 63% of the 250 consumers surveyed felt that good dealer service is extremely important. They want dealers who know their product, and know it well. Some reported that they felt factory training in the various systems the dealer sells is an important clue to his knowledge regarding that system. But other types of training in both satellite systems and electronics in general would also be valuable.

It doesn't matter how knowledgeable a dealer is about satellite systems if he doesn't respond promptly, or at all, to your service calls. Even the 47% of owners whose dealers had responded within a matter of days felt that promptness was important; and indeed, listed this as one of the major reasons they were satisfied with their dealers.

One owner suggested that an indication of how responsive a dealer will be to your service calls is whether or not he always has someone available to answer the telephone.

Another consideration is whether a dealer offers a component replacement while the broken component is being repaired. Eleven percent of the owners responding were unhappy with their dealers mainly because they did not offer them a replacement when their own broke down. Again, if this is something that is important to you, it should be spelled out in the terms of the warranty.

Does the dealer explain and demonstrate all facets of the system slowly, clearly, and with patience? Some owners reported that even though their dealer explained and demonstrated the unit, he did so in such a manner that they still did not feel that they knew very much about their system. As one owner from Michigan wrote, "A ten-year-old should understand all the buttons before the dealer leaves the house the very first day...Grandmothers will nod affirmatively knowing they still do not understand this scientific, twentieth century, 'new fangled' gadgetry."

With this thought in mind, you might want to consider (as some owners suggested) finding a dealer who has demonstration units set up in his store so you can see, and operate under guidance, the system that you are purchasing before it is actually installed in your home and the contract is signed.

Ten Questions Every Buyer Should Ask

(1) First of all, what is important to you?
(2) Is the dealer knowledgeable about his product?
(3) Are past customers satisfied with this dealer's service?
(4) Is there a written warranty provided?
(5) Does the dealer offer replacements when a component breaks down?
(6) Does the dealer fully explain and demonstrate the system in terms you can understand?
(7) Is there an owner's manual provided with the system?
(8) Does the dealer have a trade-in program for out-dated equipment?
(9) Does the dealer provide a subscription to, or give you information about, program guides?
(10) Lastly, is the dealer someone with whom you feel you can communicate?

Percentage Check

(1) 63% of the 250 owners surveyed consider good dealer service to be of utmost importance.
(2) 47% of the owners consider promptness to be a major factor in consumer satisfaction.
(3) 11% are unhappy with their dealers because they did not offer them a component replacement while their own was being repaired.
(4) 29% feel that it is important for a dealer to fully explain and demonstrate the system for new owners.
(5) 6% of the owners surveyed want dealers to provide more information concerning programming guides.

See **Buyer's Guide** on page 88

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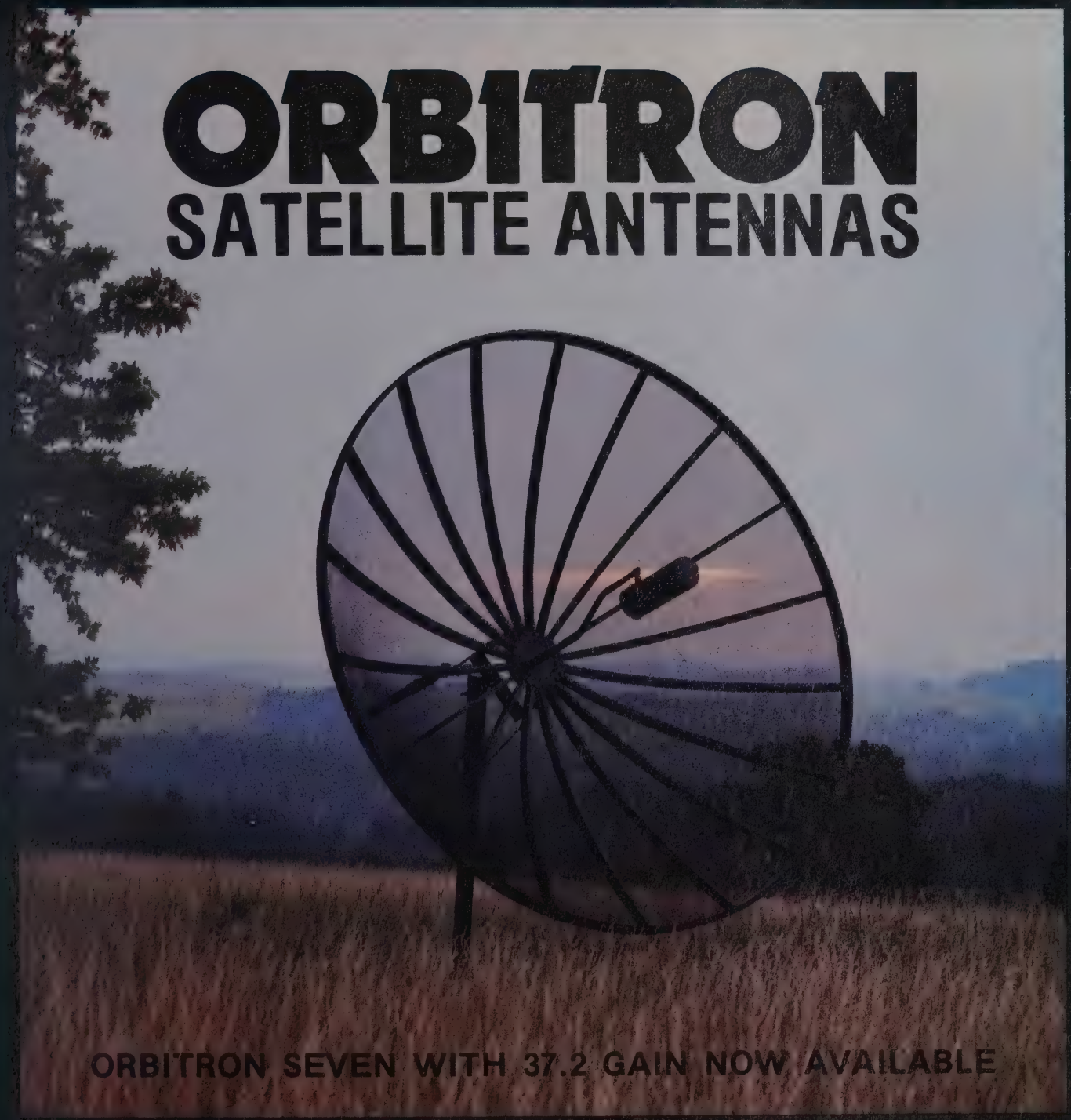

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Block Downconversion is pre-wired with amplifier and splitter. It will accept an additional tuner for separate channel viewing on a companion receiver.

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A All KLM systems come standard equipped with the time-tested black radar mesh antennas. You have a choice of 6, 8, and 11-foot sizes. The 8 and 11-foot antennas utilize an aircraft-quality, perimeter cable to secure the critical parabolic shape.

B The H2H is a true horizon-to-horizon mount. With this mount, your system has a full 180° of rotation. The mount is fully factory-assembled, and its design is impervious to icing, having been tested repeatedly at -50° F.

C In one container, everything you'll need: horn, mount and antenna, feed horn and amplifying assembly, weather-sealed cable and tuner/positioner control station. You will note from the illustration that all major components are factory pre-assembled.

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D The KLM Sky Eye X is available in either single or Block Downconversion. Every aspect of satellite and channel selection is at your fingertips. The lighted dial and cleanly designated control knobs make tuning easy and positive.

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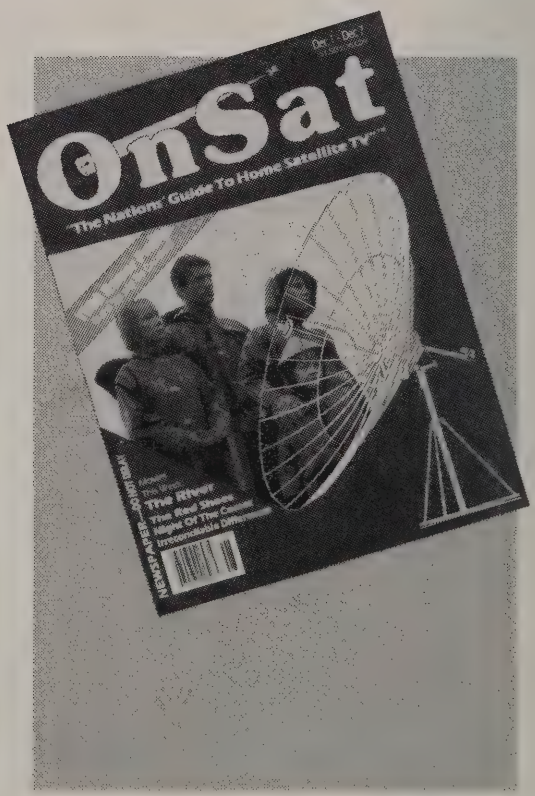

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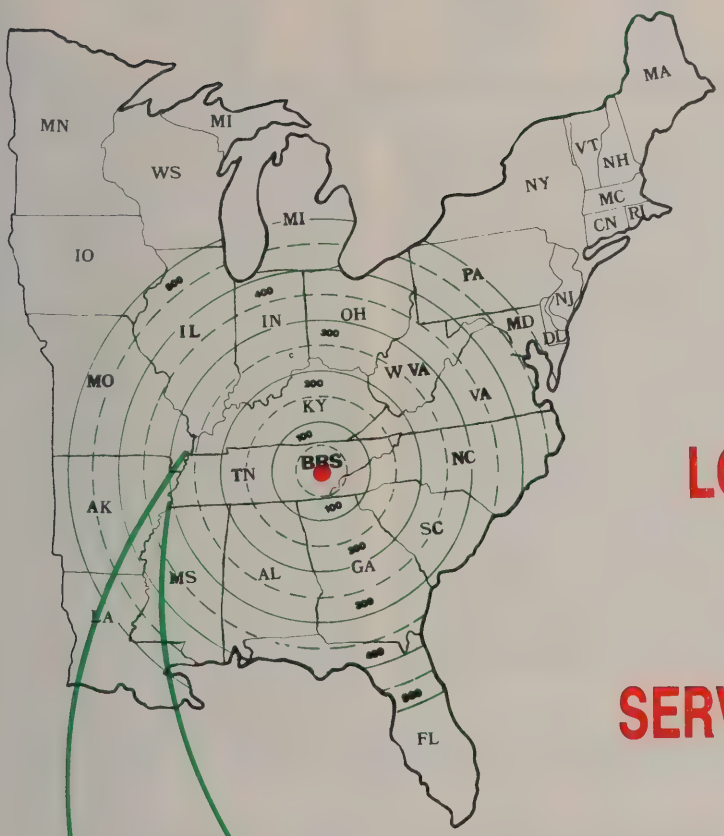

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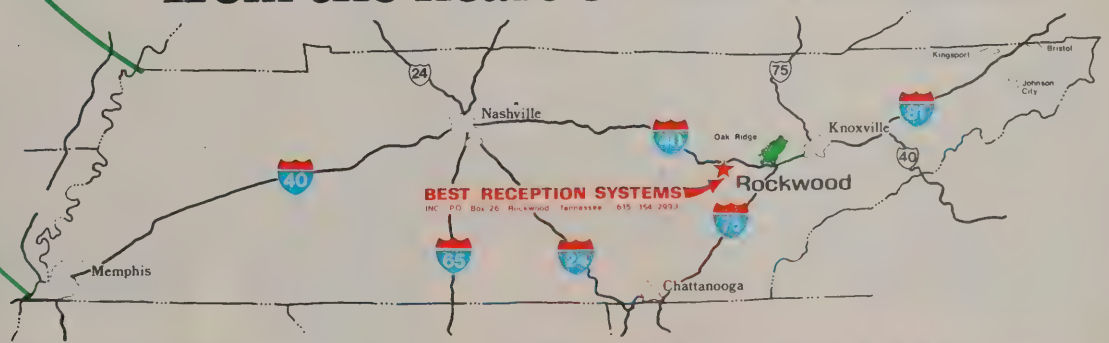

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Showtime/The Movie Channel To Begin Test-Scrambling

Test-Scrambling will begin on Monday, January 13, on the satellite feeds of both SHOWTIME and THE MOVIE CHANNEL. This was announced by Stephan Wm. Schulte, Senior Vice President, Operations and Production Services, SHOWTIME/THE MOVIE CHANNEL INC. The shipment of M/A-COM Videocipher II scrambling decoders will be entirely fulfilled by December 31, 1985 to all SHOWTIME and THE MOVIE CHANNEL affiliates who have properly registered their headends. Testing will commence approximately two weeks later, first for each service's eastern feed and later for their western feeds. The company further expects to fully scramble all satellite signals in May 1986.

"With the implementation of scrambling," Mr. Schulte stated, "we will have effectively secured our valuable programming from unauthorized and illegal use by commercial operators. Our company and our retail distributors have lost hundreds of millions of dollars as a result of these commercial ventures," he said, "funds which should have been plowed back into programming and marketing. Those losses will now cease."

Mr. Schulte stressed that the January 13 date will not be extended, making it imperative that all affiliates (who have not already done so) immediately follow through with the paperwork necessary to insure the receipt and installation of their headend decoders prior to that deadline. Affiliates who have submitted the necessary registrations will shortly receive a letter from SHOWTIME/THE MOVIE CHANNEL outlining descrambler delivery information and satellite testing availability. Transponder 16 on Galaxy I is currently carrying an encrypted signal for the aid of east coast operators as they install the M/A-COM Video-Cipher II. Later this month, Satcom F3R, Transponder 12, will begin carrying an encrypted signal for west coast affiliates wishing to test their newly-installed descramblers. Testing on SHOWTIME and THE MOVIE CHANNEL will initially be for short durations daily and will gradually increase until May, when the company expects to encrypt all satellite feeds full-time, barring unforeseen technical problems.

South Dakota Governor Invests In TVRO System

South Dakota's Governor, William Janklow, recently had an Anderson Scientific TVRO System installed at the Governor's Mansion.

Governor Janklow has been an avid supporter of TVRO since he first installed a Scientific Atlanta system in 1981. That commercial system included a cable to the capitol building for reception of broadcasts direct from Washington, DC.

Feeling that it was time for a more modern system, Governor Janklow contacted Anderson Scientific and ordered their MicroVision III system. The system includes a precision three-meter (10 ft.) black mesh dish with polar mount and Anderson master and slave block downconversion receivers.

Governor Janklow wanted a dish drive, digital channel readout, and programmable controls, so he also ordered a Houston Tracker V to interface with his Anderson System.

Governor Janklow was excited that he could obtain the ultimate system by purchasing a product made in the USA, but he was even happier to find that Anderson equipment was manufactured in his home state, South Dakota.

Governor Janklow is expected to be South Dakota's next United States Senator. He will surely be a staunch supporter of TVRO rights in Washington, DC.

What does Governor Janklow think of scrambling? There are over a hundred available channels right now and others are entering the scene for the sole purpose of serving the home satellite market... if a few programs are scrambled, he will not even miss them!

Governor Janklow is thrilled with his system and, as an industry pioneer, he feels that TVRO is the wave of the future.

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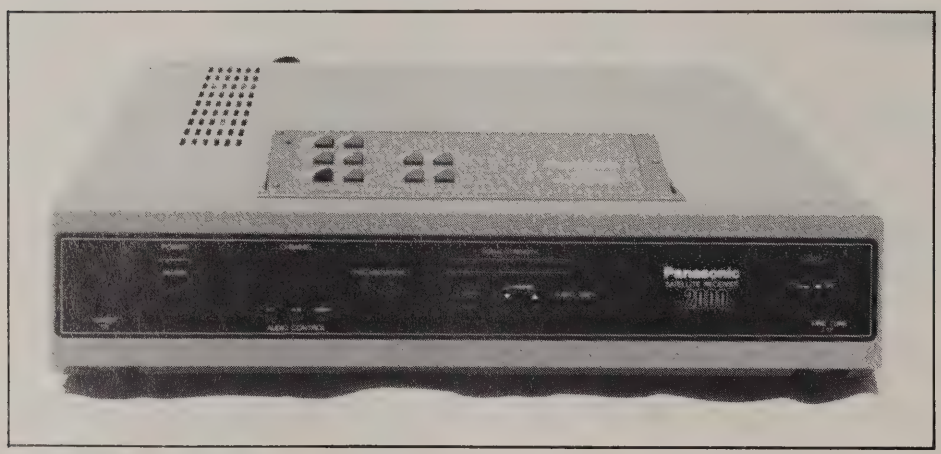
Product Review: The Panasonic C-2000

by Mike L. Gustafson

The product review for this month covers a satellite receiver built by one of the largest of the well-known Japanese companies. The C-2000 receiver is manufactured by Matsushita Electric Corporation under the Panasonic name. Panasonic is well known for their many consumer electronic products. The majority of the video tape recorders that are currently sold in the U.S. are probably built by Matsushita under the Panasonic label. The C-2000 satellite receiver marks Panasonic's entry into the satellite TV market.



The Panasonic C-2000 Receiver.

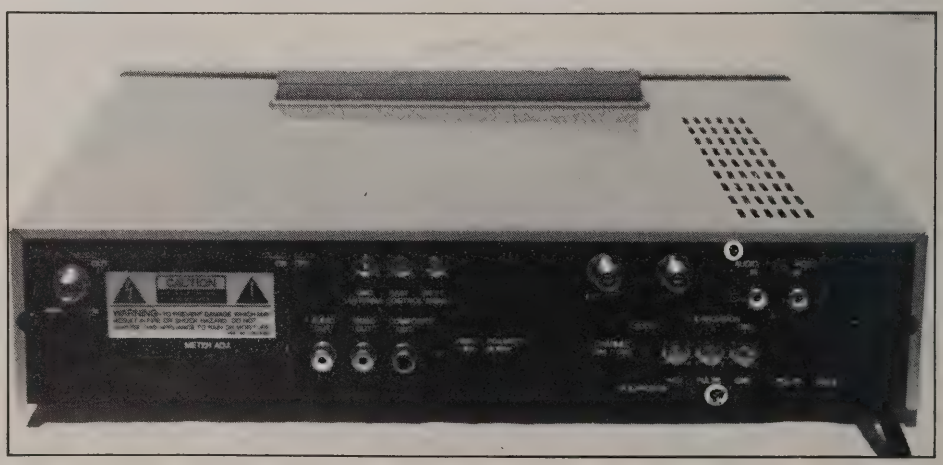
The C-2000 is a block down-conversion system using the popular 950 to 1450 MHz intermediate frequency. The receiver comes with an 85 degree low noise block down-converter and infrared remote control. The C-2000 is aimed at the medium priced market when you consider what features are present on the receiver. The C-2000 even offers, as an option, an antenna positioner power supply. The receiver remote control includes buttons for controlling the antenna drive system. The control system is nothing more than a simple East/West drive. This review does not include the drive system.

The receiver is rather pleasant looking with those all-too-familiar stereo cosmetics. The channel numbers are displayed on two large numerical displays on the front panel. Other controls on the front panel include channel up/down buttons, a polarization reversal button, and a horizontal bar graph which displays signal strength. A polarization skew control is found under the left side of the front panel, and the video fine tuning knob is under the right side of the front panel. The audio channel selection is automatic in that any time you change video channels the audio channel is automatically set to 6.8 MHz. With the remote control you can select 6.2 MHz or you can go into the seek mode. In the seek mode, the audio channels are scanned until a channel is found, then it stops. During this operation the audio output is muted.

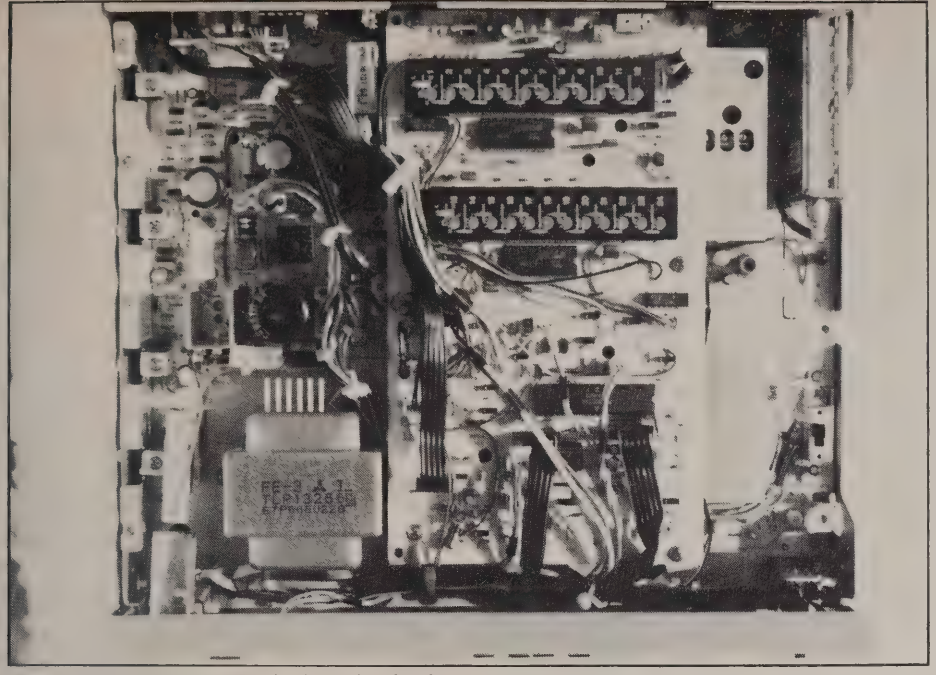
The receiver does not use a frequency synthesizer for channel selection so there is an AFC (automatic frequency control) on/off button also located on the front panel. Between the stability of the LNB and the AFC control you should not have to worry about video channel fine tuning. I say should not; unfortunately, the unit I tested required a lot of fine tuning as I changed channels and the AFC was of dubious value. More on this later in the review.

Controls found on the remote include video channel selection, audio seek, volume control, polarization format reversal, and antenna drive East/West buttons. One neat thing about the remote unit is that it has a storage notch in the top of the receiver that allows the remote to function as a local control panel as well.

The rear panel sports all kinds of neat features from channel scan, to external audio and video inputs for the internal modulator. The later connections can be used with decoders designed for the up and coming scrambling systems. The C-2000 is designed to handle both magnetic and pulse type polarization feed systems. There is a switch on the rear panel that selects which polarization circuit is used. Be sure to select the correct position prior to making the feedhorn connections on the terminal strip, also found on the rear panel. The user's manual is a little vague



Simple, easy to understand rear panel connections.



Tight but well labelled electronics keep the size down.

on how to use the terminal strip if you are using a magnetic style feedhorn system. It turns out that the ground connection is still ground, but the pulse and +5 volt connections become the + and − connections, depending on the position of the front panel polarization switch. If you intend to use this type of feed system I suggest that you use a volt meter to sort it all out to your satisfaction.

One last feature that bears mentioning is the clamp disable switch found inside the receiver. Between the composite video out, the audio and video input, and the clamp switch, the C-2000 is set up to handle the two major decoder systems currently on the market.

Installation

Installation of the C-2000 receiver is very simple. The low noise block downconverter is installed on the feedhorn located at the focal point of the antenna. Depending on the type of feed used, you must run either a three or two conductor cable from the receiver out to the feedhorn. The intermediate frequency of 950 to 1450 MHz is conducted down a single cable between the LNB and the receiver. The installation kit that comes with the receiver includes connectors designed to install on RG6 type cable. Considering the IF used, I would recommend you go along with Panasonic's hint and use the better cable.

The receiver requires no channel programming upon initial activation. The polarization control circuit requires that the feed orientation be fairly close for the correct polarization position selected by the receiver. What that means is that you have to go outside and rotate the feedhorn until the polarization indicated by the receiver matches the video channel viewed on the TV set. One point of interest is that there are no external polarization adjustment controls on the receiver except the skew control on the front panel.

Operation And Subjective Evaluation

Based on my knowledge of previous Panasonic products, I had very high expectations for the C-2000 receiver. Unfortunately, I was disappointed in a couple of major areas. The remote control does not include a fine tune control and I found that I had to adjust the front panel fine tuning on many channels. The AFC circuit did not seem to do as good a job in tuning in the best picture as the manual fine tune control did. Even when the best picture the C-2000 had to offer was displayed on the color monitor, it was not as good as it should have been. The LNB provided was labeled as an 85 degree Kelvin model, but based on my knowledge of the antenna system used, and the amount of sparkles and noise noticed in the picture, I don't believe the label was correct. When the video signal-to-noise ratio was measured, the resulting data supported my theory that the LNB was not as good as indicated by the label.

The audio section and automatic tuning pictures worked pretty well. The only problem I found was that once in a great while the audio system would indicate that the 6.8 MHz subcarrier was tuned in, when in fact only hiss was heard. I would cycle the video channel selected and then the audio channel would be just fine. The audio seek circuit

Typical frequency response for the C-2000.

CONSUMER DATA SHEET

Panasonic C-2000 Receiver

VIDEO SIGNAL-TO-NOISE RATIO

Excellent	Good	Fair	Poor
(45-48 dB)	(40-44 dB)	(35-39 dB)	(<35 dB)

PICTURE QUALITY

Excellent	Good	Fair	Poor

VIDEO FREQUENCY RESPONSE

Excellent	Good	Fair	Poor
(+/−1.0 dB)	(+/−2.0 dB)	(+/−3.0dB)	(>3.0 dB)

VIDEO THRESHOLD

Excellent	Good	Fair	Poor
(<7.0 dB)	(<8.0 dB)	(<9.0 dB)	(>9.0 dB)

IF NOISE BANDWIDTH

Excellent	Good	Fair	Poor
(>30 MHz)	(27-30 MHz)	(24-26 MHz)	(<24 MHz)

AUDIO DISTORTION

Excellent	Good	Fair	Poor
(<1.0%)	(1.0-1.5%)	(1.6-2.0%)	(>2.0%)

AUDIO SIGNAL-TO-NOISE RATIO

Excellent	Good	Fair	Poor
(>47 dB)	(44-46 dB)	(40-43 dB)	(<43 dB)

AUDIO FREQUENCY RESPONSE

Excellent	Good	Fair	Poor
(100-15KHz)	(400-12KHz)	(800-10KHz)	(1k-8KHz)

BLOCK DOWNCONVERTER

Type—Single Conversion
Intermediate Frequency 70 MHz

LOCAL OSCILLATOR LEAKAGE

Excellent	Good	Fair	Poor
(<−60 dBm)	(<−40 dBm)	(<−20 dBm)	(>−20 dBm)
N/A			

IMAGE REJECTION

Excellent	Good	Fair	Poor
(<−20 dBc)	(−15−20 dBc)	(−12−15 dBc)	(>−12 dBc)
N/A			

FREQUENCY STABILITY

Excellent	Good	Fair	Poor
(<1.0 MHz)	(1-3 MHz)	(4-6 MHz)	(>6 MHz)

OPERATING FEATURES

Excellent	Good	Fair	Poor

USER'S MANUAL

Excellent	Good	Fair	Poor

EASE OF INSTALLATION

Excellent	Good	Fair	Poor

ANTENNA POSITIONER

Installation

Excellent	Good	Fair	Poor
N/A			

EASE OF SATELLITE POSITION PROGRAMMING

Excellent	Good	Fair	Poor
N/A			

POSITIONING REPEATABILITY

Excellent	Good	Fair	Poor
N/A			

OVER-ALL SYSTEM SCORE

Excellent	Good	Fair	Poor

worked fine and was a neat way of hunting for different audio channels by remote control. The bandwidth is fixed in the wide position which means the narrow subcarriers are too noisy to listen to, but all the normal audio channels sounded fine. MTV and VH-1 both sounded great so I was happy to use the C-2000 as a background music generator in the lab.

The video selection is sequential, that is, the channel buttons only increment the channel by one number. If you are on channel 12 and want 24, you have to go through 12 channels to get there. Not a problem since you can go through those 12 channels as fast as you can punch the buttons. Of course, the polarization is changed as you change channels. When you change satellites and need to reverse the polarization format, you just hit the V/H button on either the front panel or the remote and the job is done.

The audio is muted during the video channel selection so you are not blasted out of your seat as you go from channel to channel. The audio volume control comes in real handy when the phone rings or you need to carry on a quick conversation without getting up out of your easy chair.

One interesting side note is the amount of delay between selecting a new video channel and the correct audio and video popping up on the TV set. It is possible to jump through the channels very fast. When you stop and are waiting for the system to display this new channel, there is a three count while the system gets its act together. No big deal, just an interesting point to keep in mind.

Things I Would Like To See Changed Or Added To The C-2000

I would like to see separate vertical and horizontal polarization controls available on the rear panel for use during initial installation. Either the AFC circuit needs to be made bullet proof or a video fine tune control should be put on the remote. What good is a remote control if you have to walk over to the receiver to touch up the tuning for some of the channels. There are channel tuning controls on the inside of the receiver, but the user's manual does not explain how to make any adjustments. Since the

controls are on the inside. I assume we are not supposed to mess with them, but my receiver needed some of the channels touched up and I couldn't do it. Put these controls on the bottom and Panasonic will reduce the number of receivers returned just for channel tuning!

The threshold of the C-2000 is a little higher than I like to see, and coupled with the questionable noise temperature of the LNB, leads to less than enviable video quality. I would like to see Panasonic use a different demodulator scheme and lower the receiver threshold. I know the video quality can be better than what I am seeing on the current model.

Things I Liked About The C-2000

By the time I listed all the things I liked about the Panasonic the list was too long to print. I thought the cosmetics were quite good and the simple operation of the total package should offer no problems to any member of the household. The volume control is a very nice addition, not usually found on receivers in this price category. One feature that won my heart was the polarization reversal button on the remote control. I change satellites a lot, and not having to wander over to the receiver each time I moved the antenna was greatly appreciated. While I normally don't like bar graphs for signal strength meters, the meter on the 200 worked very well and was useful in setting the antenna exactly on the satellite. I still would like to see a real meter, but oh well, you can't have everything.

Panasonic should get high marks for building in all of the connections and controls for interfacing to video descramblers. The external audio and video inputs to the 2000 allow the internal modulator to upconvert the decoder signals up to the VHF output. The internal clamp switch and the baseband output complete the controls and connections you will need if you elect to purchase a decoder.

Conclusion

The C-2000 is Panasonic's first entry into the satellite TV market and like anything that you do for the first time, problems can crop up. I expected better receiver performance from one of the leaders in the home electronics field. I may be too hard on Panasonic because it is their first shot at building a consumer C-band satellite receiver but the C-2000 is not up to the normally high standards of other Panasonic products.

Given all of the above comments, I still thought the C-2000 was a good receiver. It has a few minor problems, but given a good size antenna and a fearless installer who is willing to go inside the receiver to touch up each of the channel settings, the 2000 will perform quite well. I have faith that the engineers at Panasonic are listening to their customers, so the needed modifications are surely on the way. So if you are looking for a medium priced satellite receiver with good features and fair performance, then I recommend the C-2000 for your consideration.

Ⓢ Ⓣ Ⓥ

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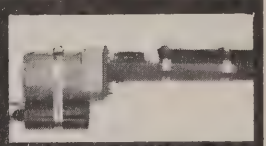

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Figure 1

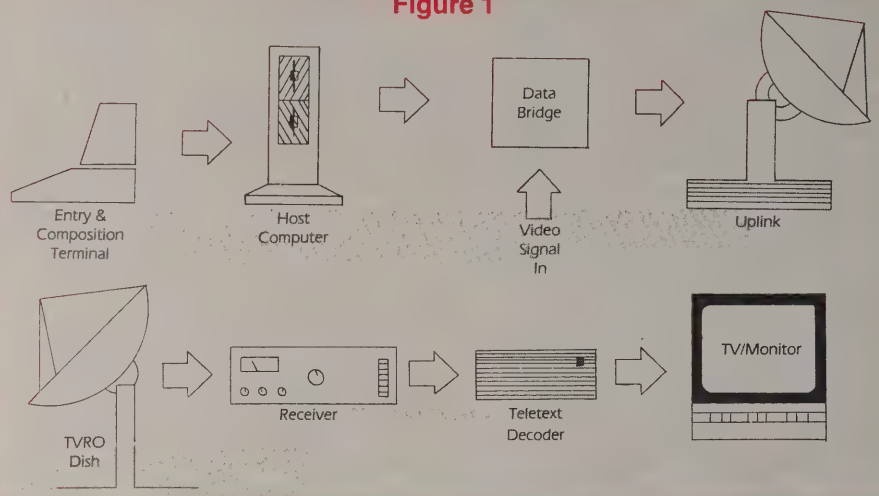


Figure 2

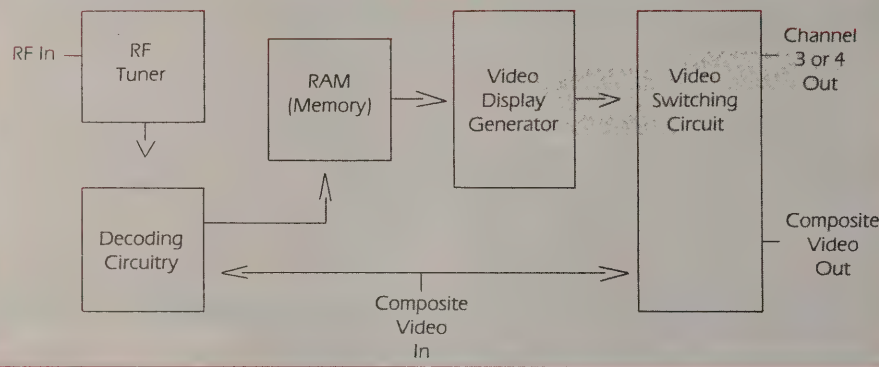
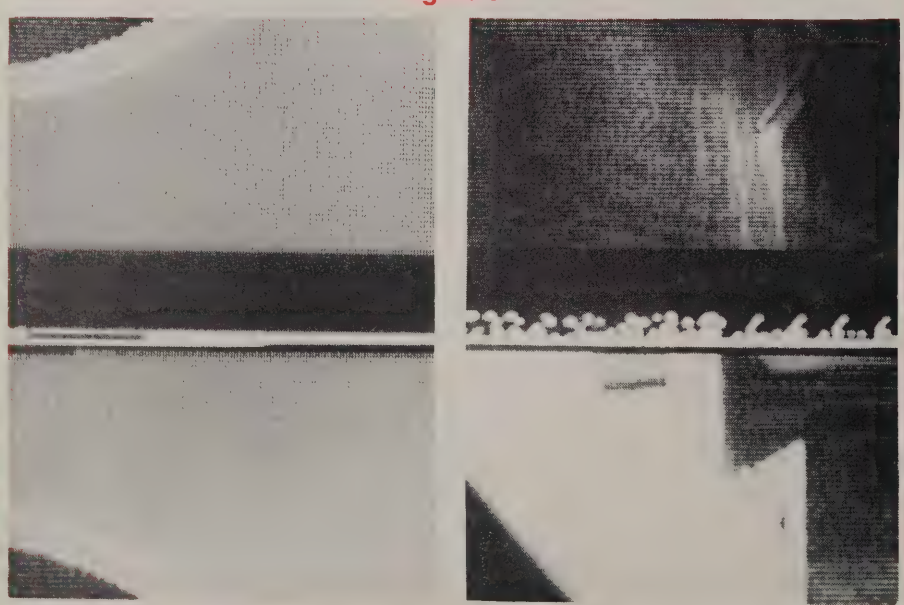


Figure 3



If a station is not carrying teletext, it will look like the left side of Figure 3: smooth, black, and steady. The presence of white dots (right side) indicates the presence of teletext data.

Teletext cont. from page 22

on the satellites.

The largest and most diversified service, called Electra, is found in the VBI of Superstation WTBS (Galaxy 1, transponder 18). It is produced by Taft Broadcasting of Cincinnati, and is broadcast locally there on WKRC. Satellite Syndicated Systems of Tulsa provides the link between Taft and TBS.

Electra is a 100-page magazine composed of fast-breaking news, financial information, sports scores and data, and features such as weather and a daily trivia tidbit. The information isn't just up-to-the-minute; it often updates while you're watching! No more waiting for the newspaper or 11 o'clock news, and no more—thank God!—being annoyed by news teasers. Simply call up Electra, and there's the very latest news.

If you're a real news junkie, you can set the decoder to the newsflash page—150—of Electra, in Mix mode. The screen is normally held blank, so the TV image is undisturbed, but if a hot story breaks, a line of text appears at the bottom of the screen to tell you what page to see for details.

If you're a sports fan, you can find out all of the current scores by going to the appropriate page—and if you do it in Mix mode, you can do it without missing the game you're watching. No more waiting for halftime!

More than one magazine can be transmitted on a single channel's VBI—up to four, actually—but the only example of such stacking is found on WTBS. Satellite Syndicated Systems, in addition to linking Electra to the station, produces another magazine called Cabletext. Electra is found on pages 100-199; Cabletext, on pages 200-212. The only way to explain Cabletext is that it's like having your own stock ticker. Pages 200-202 are the title and index, and 203-211 contain NYSE and OTC stock quotes, delayed by only 15 minutes from the Big Boards when they are open. Page 212 is what's termed a rolling page; with the decoder set to this page, it will step through the other pages in about a four minute cycle.

In this rolling page (and nowhere else) is something unique in teletext: a one-page ad for Zenith computers and

TVs. It represents the only advertising currently on teletext. Although more will follow, teletext ads will be few and far between for years yet.

Both Electra and Cabletext are also available on Satcom F3R, transponder 6 (SPN), for those that can't receive Galaxy 1. The programming is identical.

The third major service on satellite is found on Galaxy 1, transponder 22 (The Discovery Channel). Called INFOTEXT, it is produced by the University of Wisconsin and is broadcast by eight TV stations across that state. It is primarily an agricultural service, with an extensive and changing list of bulletins on everything from beekeeping to swine inoculation. There is information of interest to gardeners, as well, and it makes interesting reading even to those living in city apartments. Its detailed weather pages and AP news page give it some general appeal as well.

Although these three services—Electra, Cabletext, and INFOTEXT—form the backbone of the satellite teletext programming, there are other services to be found, and more will be arriving in the near future. Although a decoder is needed to view these services, it's easy to locate them without one. Simply adjust your TV's vertical hold until the VBI is visible, and tune up every channel you can receive clearly (including cable and broadcast stations). If a station is not carrying teletext, the VBI will look like the left side of Figure 3: smooth, black, and steady.

If teletext data is present, it will be visible as rows of dancing white dots, like the right side of Figure 3. You don't need to squint; it's easy to see the data if it's there. When you get a decoder, you'll probably be able to receive most of these services.

However, a word of warning: unless you invest in a very expensive multi-standard decoder, you won't be able to receive all of them. With a WST decoder (the only one you'll really need), you'll get almost all of the services; adding an NABTS format decoder will add a few more services, including CBS's Extravision service. Finally, if you're interested in teletext from the Canadian birds, you'll need a Telidon format decoder.

Finally, the big worry with any satellite programming is the dreaded S-word: scrambling. Scrambling of teletext signals isn't just possible, it's easy, since the signals are digital already. However, teletext scrambling can be summed up in four words: it ain't gonna happen. The current push is to build as large a viewer base as possible, mainly so that advertising will eventually be profitable. This aim simply precludes scrambling. (Yes, advertising is an evil, but it's a lesser evil than scrambling!)

As further proof of this, consider the fact that Electra and Cabletext are not only free to viewers, but are free to any broadcaster who wishes to insert them on his own VBI. These services will probably be the first to appear on your local TV stations, since the equipment required to transfer them from satellite to the broadcaster's VBI is quite cheap. After that, the local station will begin inserting their own pages, and perhaps later, will construct their own entire magazine. At that point, everyone will be getting all excited about this new medium.

But, of course, it'll be old news to you.

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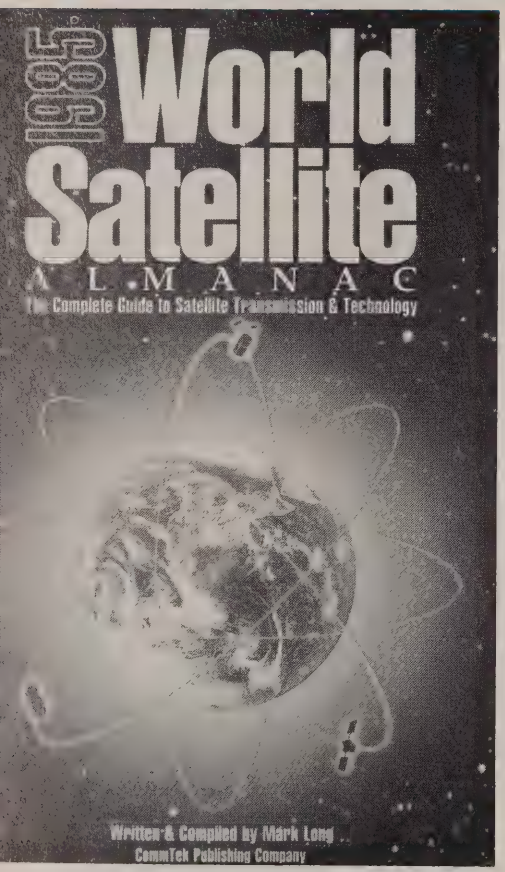
Book Review

by Allen Teasley

"1985 World Satellite Almanac"



Writer Mark Long, along with his editor Bruce Kinnaird, has really outdone himself with the publication of his new book **1985 World Satellite Almanac.** This book is practically a one-volume encyclopedia and, as Ed McMahon would say, "EVERYTHING you ever wanted to know about anything is in this book"—everything about artificial satellites, that is! Mr. Long is a veteran satellite industry writer, having co-authored **The World of Satellite Television** (with Jeffrey Keating) in 1983.

When I first opened the Almanac to read the introductory section, I was thrown for a loop. Not only does the book offer an excellent, descriptive introduction in English, but the same material is also offered in French, Spanish, Italian, and German. There are a lot of potential readers of satellite material in the world. This is the first attempt that I have seen to reach these prospective readers via one publication (at least in this industry). The old cliche' about the world getting smaller everyday is more accurate than most can imagine; it is refreshing to see an enterprising author who realizes this and who has the foresight to reach out to foreign readers.

The 1985 World Satellite Almanac is billed as "the complete guide to satellite transmission and technology," and believe me, that is not an understatement. Mark Long was definitely on the ball when he devised this book, soliciting information from the most prestigious companies and individuals within the satellite and space technology industries.

The 542-page book is divided into two parts. Part One begins with the multi-language user's guide and introduction. From here, the book traces the history and evolution of satellite technology, including a preview of domestic satellites in North America and Europe, the home TVRO revolution, and what developments to expect in this decade.

Chapters two, three, and four are devoted to satellite transmission and reception techniques, with a focus on C- and Ku-band satellite reception. There is a section on interpreting footprint maps for both Ku- and C-band satellites. Besides having sections on how to choose Ku- and C-band receiving equipment, there is information on retrofitting C-band dishes to Ku-band, dual-reception of both C-and Ku-band, and fiberglass versus solid metal dishes. The remaining chapters of Part One are devoted to the Intelsat global satellite communications system, Intersputnik and the Soviet Statsionar satellite system, the Inmarsat maritime satellite system, and new domestic and regional satellite systems (including Morelos,

The old cliche' about the world getting smaller everyday is more accurate than most can imagine; it is refreshing to see an enterprising author who realizes this and who has the foresight to reach out to foreign readers.

Brazilsat, Eutelsat, Aussat, French Telecom, and Arabsat), respectively. Each of these chapters is loaded with pertinent, useful, and revealing information on their respective subjects, covering each theme rather thoroughly.

In part two, Long covers the International Telecommunications Union (ITU), which is the foremost agency devised to regulate international civil communications. This regulatory body has divided the world into three imaginary regions and oversees such agencies as the Regional Administrative Radio Conference (RARC) (which meets to assign frequencies, spacing, and orbital positions for satellites in the western hemisphere). Long dedicates a chapter to each ITU region.

Chapter 12 is probably the most useful part of the book—however, this is not a chapter at all. This is the area of the 1985 World Satellite Almanac which contains the 15 appendices to the book. That's right, 15 appendices! And each one covers a different aspect of the satellite communications industry. Included are: back-off charts (in decibels); charts showing the

Continued

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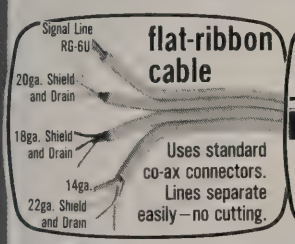

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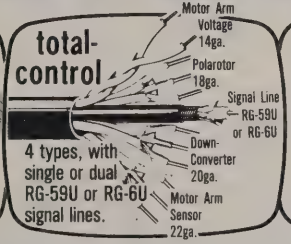

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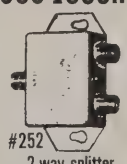

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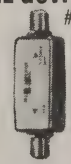

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placement of Ku-and C-band geosynchronous satellites; international and obrital frequency assignment plans; NASA STS and Ariane satellite deployment schedules through 1987; a GMT conversion chart and international time zone map; and world television systems standards, among others. Four of the appendices are in directory form and cover satellite operators, manufacturers, and service organizations, along with a compilation of international satellite-delivered television services. The remaining three appendices are devoted to Ku- and C-band margin-above-threshold charts, a glossary of terms, and, finally, an index of satellites and their positions.

Within the main body of the book, each satellite is introduced with technical and background information on that particular satellite, usually followed by its operational or planned capabilities. After most entries, a reference chart called 'Satellites at a Glance' is offered. This chart provides ready reference on the satellite's operational history, communications payload, and vital statistics on the satellite proper (ie. size, weight, power). These charts provide information on the amount of transponder bandwidth, assigned transponder code numbers, polarity, uplink/downlink frequencies, and other interesting and useful facts.

The Random House College Dictionary defines an almanac, in part, as being "a compendium of useful and interesting facts." That definition can readily be used to describe this book.

Some may view the advertising pages at the beginning and end of the World Satellite Almanac as superfluous. I mean, no one wants to look at ads, right? If not, simply thumb past them. Besides being attractive and informative, these advertisements help to hold the cost of this book down to $39.95 (suggested retail price).

The Random House College Dictionary defines an almanac, in part, as being "a compendium of useful and interesting facts." That definition can readily be used to describe this book. I definitely recommend the "1985 World Almanac" to TVRO owners, enthusiasts, and connoisseurs everywhere! The back cover states: "Now...everything you need to know about all the world's satellites explained, illustrated, footprinted, indexed, and analyzed in one authorative source." Hats off, Mark Long, I could not have said it better.

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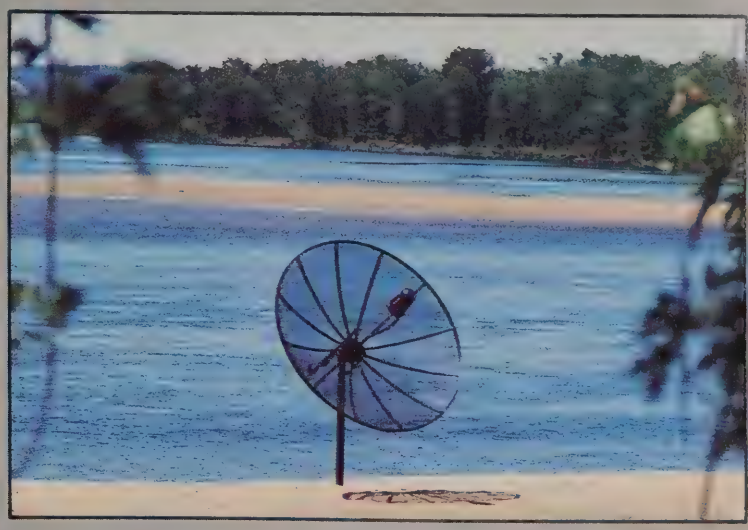

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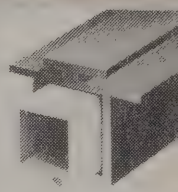

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Canadian Scene cont. from page 8

intelligence, remote control, and on and on. All this took place between 1982 and 1984.

The judge had to comprehend all of the technological changes and was obviously having difficulty. He kept wanting to approach the case on a value for money issue. The tide turned when two competing dealers were called to testify in the consumer's defense. To everyone's surprise they took the stand and testified that they also had hundreds of consumers in the same position.

Mercifully, the judge ruled that the dealer should sell the older system for today's market value and reimburse the consumer with the difference, after installation. We were elated as a precedent in law of this type could set the stage for many more court challenges and a lot of dealer grief.

This is but one case in a multitude of actions that have gone before the courts touting the same issue. Many satellite dealers from the old school who installed these early systems get a rush of embarrassment when they think about older configurations. A closet skeleton approach is taken and dealers avoid these consumers like someone who has a contagious disease.

To prevent a situation which may end up in the courts, wouldn't it be prudent for dealers to contact these consumers and offer an update at a reasonable cost? Then we could avoid the bad publicity and create extra work during the long, lean Canadian winter.

The message to learn from this case is to communicate with the owners of older systems. Some people will try to tell you all these systems are updated.

In closing, the message to learn from this case is to communicate with the owners of older systems. Some people will try to tell you all these systems are updated. I know of many systems that still have rotors as polarizers. I have yet to get a bad reception from the dozens I revised. Try it, you may like it. Ⓢ Ⓣ Ⓥ

A Few Words cont. from page 12

the satellite system working?" "Oh that," he replied. "We got that up and running a while back and it was as easy as you said it would be." Piece of cake and all that. I was shocked, amazed, impressed, flabbergasted, and disappointed? Well, keep in mind that I come from the old school where we are quick to say how easy the systems are to install, but really don't expect anyone to pull it off that easy. Where can we technical types find a haven any more these days?

Well, keep in mind that I come from the old school where we are quick to say how easy the systems are to install, but really don't expect anyone to pull it off that easy.

After I got up off the floor and started asking questions, it seems that Dale really had gotten the antenna assembled, the receiver and drive installed and was watching Satcom F3R. I, unbelieving, asked some probing questions about certain channels on various satellites, and he had all the answers. He had an operating satellite system without benefit of high priced talent: how demoralizing for us high priced types. The point is, if Dale Trink can do it by just following written directions carefully, so can you.

So if you have a spare weekend or two and you are looking for a project that will win friends and influence enemies, try installing your very own satellite system. Just to be on the safe side I would recommend that you have a qualified installer in the wings if need be, but you probably won't need any help. Select a system that has complete, easy to understand, assembly manuals for the antenna, receiver, and power drive. No sense making this project any harder than it has to be!

You can tell me, Donald, did he really put it all together without your help?

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• Services OnSat Carries — Transponder

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TRANS H / V	F2 72° W Satcom F2R	F4 81° W (83°) Satcom F4	T2 85° W (87°) Telstar 302	T1 97° W (96°) Telstar 301	W4 99° W Westar 4	AD 104.5° W Anik D
1		• Home Shopping Network				Occasional Video
2	Occasional Video	• Bravo 6.8 MN / 5.8 MX		• CBS (Reg. Programs) ■ 5.8 & 6.8 MN		• The Sports Network 6.8 MN
3		• Commerce Sat.Network 6.8 MN		ABC (Occasional) 6.2 & 6.8 MN		
4		• Nickelodeon (W) 6.8 MN		ABC LA Feed) 6.2 & 6.8 MN		Global TV (O/V) 6.8 MN
5		ABC (W) (O/V) 6.2 & 6.8 MN		Occasional Video		Occasional Video
6		• Madison Square Garden 6.8 MN		ABC (Occasional) 6.2 & 6.8 MN	Wold Communications Word Of Faith Sat. Network	Much Music Networ 5.41 & 6.2 DS
7		• World Christian Net. 6.8 MN		• CBS (Reg. Programs) ■ 6.2 & 6.8 MN		Occasional Video
8		Netcom (Occasional) 6.2 & 6.8 MN			Occasional Video	CHCH-TV (Scrambled (Hamilton, Ontario)
9		• Sportsvision 6.8 MN		• Wold Satellite Network 6.2 & 6.8 MN	Occasional Video	WDIV-TV (Scrambled (Detroit)
10		• American Movie Classics (Rainbow Prog.) - 6.8 MN	ABC (Closed Circuit) 6.2 & 6.8 MN	• ABC (Reg. Programs) ■ 5.8 & 6.8 MN	Word of Faith Sat. Network Occasional Video	WXYZ-TV (Scrambled (Detroit)
11		• Home Sports Entertain. (Houston) - 6.8 MN	ABC (O/V) 6.2 & 6.8 MN	Occasional Video	CTNA (S) / Wold 6.2 & 6.8 MN	• CBC North (Pacific) 6.8 MN
12		• Playboy Channel 6.8 MN		• ABC (Reg. Programs) ■ 5.8 & 6.8 MN		
13	NASA (Contract Ch.) 6.8 MN	• New England Sports Net. 6.8 MN		Hughes TV Network INN -6.2 & 6.8 MN		SYN / SAT Hollywoo 6.8 MN
14		• HSE (Alternate) 6.8 MN		Independent Net.News(NY) (O/V) - 6.2 MN	Occasional Video	TCTV (Scrambled) (Montreal)
15		Healthcare Information Network	CBS (LA / NY Feed) 5.8 & 6.2 MN	CBS (O/V) 6.2 MN	• PBS (Schedule A) 6.8 MN	• CBC (French Channe 6.8 MN
16		Silent Network • Boresight-Thur/9 PM (ET)	CBS (Pacific Time Feed) 6.2 MN	Occasional Video	CNN (Contract Channel) Turner Broadcasting (O/V)	CBC Parliament (Fren CBC North (Pacific)
17		Occasional Video	CBS (Toronto) Occasional Video	Occasional Video	• PBS (Schedule B) 6.8 MN	Occasional Video
18		Occasional Video		Occasional Video		CITV - TV (Scrambled (Edmonton, Alberta)
19		• WPIX (New York) 6.8 MN	CBS (Test Channel) 6.2 MN	Occasional Video	Bonneville DEMSAT -6.8 MN	• CBC North (Atlantic) 6.8 MN
20		NBC (Burbank Feed) 6.2 & 6.8 MN	• CBS (Reg. Programs) ■ 6.2 MN	Occasional Video	ABC (Contract Channel) 6.2 & 6.8 MN	• CBMT (Montreal) (English) - 6.8 MN
21		• Nostalgia Channel 6.8 MN	Netcom (Occasional) 6.2 & 6.8 MN		• PBS (Schedule C) 6.8 MN	WTVS - TV (Scrambled (Detroit)
22	AFRTS 6.8 MN	• Home Team Sports • Sat. Showtime-Tues/10 PM	Occasional Video		Occasional Video	BCTV (Scrambled) (Vancouver, B. C.)
23		Odyssey Channel 6.8 MN / 5.58 & 5.76 DS	Occasional Video	• Wold Satellite Network 6.2 & 6.8 MN	• PBS (Schedule D) (O/V) 6.8 MN	WJBK (Scrambled) (Detroit)
24		• Nightline TV Network 6.8 MN	Occasional Video	Occasional Video	Bonneville Satellite Corp. 6.2 & 6.8 MN	CBC Parliament (Engli CBC (French Channe

Note: Satellite locations in parenthesis indicate that satellite's current position. In the near future, many of these will change to the new locations shown due to t

DS = Discrete Stereo MS = Matrix Stereo MX = Multiplex Stereo MN = Monaural DT = Digital Stereo

Spacenet 2 - 69°	Galaxy 2 - 74°	Westar 2 - 79°	Westar 3 - 91°	Galaxy 3 - 93.5°	Anik B - 109°	Morelos 1 - 113.5°	Aurora F5 -
18 Occasional Video	13 Occasional Video	3 Occasional Video	5 CNN(Contract Ch.)	2 Occasional Video	7 Occasional Video	12 XEW (Mexico City)	6 Occasional
20 Occasional Video	15 Indep. Sat. Net.	5 Occasional Video	9 Occasional Video	4 Occasional Video	13 Occasional Video	14 XHITM(Mex. City)	13 NASA(Pacif
	16 Hughes(O/V)	11 Occasional Video	11 Occasional Video	6 Occasional Video	15 Occasional Video	22 XHDF(Mexico City)	19 Occasional
	17 Occasional Video	15 Occasional Video	13 Occasional Video	8 Occasional Video	21 Occasional Video	24 KFMB(San Diego)	20 Learn Alask
	18 Occasional Video	19 Occasional Video	15 Occasional Video	9 Occasional Video			21 Occasional
			17 Occasional Video	10 Occasional Video			24 Alaska Sat.
			19 Hughes Net.(O/V)	11 Occasional Video			
			21 Brightstar (O/V)	12 Occasional Video			
			23 Occasional Video				
			24 Brightstar (O/V)				

ervice Watch

• Services OnSat Carries

CTUATOR NUMBERS FOR EACH SATELLITE.

W	W5 124° W (122.5°) Westar 5	T3 126° W (125°) Telstar 303	F3 130° W (131°) Satcom F3R	G1 132° W (134°) Galaxy 1	F1 138° W (139°) Satcom F1R	W TRANS H / V
cenet 1 *	**NYRA** (Scrambled) (New York Racing Authority)	• **Country Music TV** 6.8 MN / 5.58 & 5.76 DS	• **Nickelodeon** (E) 6.8 MN		Occasional Video	1
	University Network 6.2 & 6.8 MN	• **Selec - TV** 6.8 MN	• **PTL Network** ■ 6.8 MN / 5.58 & 5.76 DS	• **Nashville Network** 6.8 MN / 5.58 & 5.76 DS		2
neville Satellite Corp. 6.2 & 6.8 MN	**Group W Satellite Comm.** (Occasional)		• **Trinity Broadcasting Net.** 6.8 MN	• **WGN - TV** (Chicago) 6.8 MN	**Digital Radio**	3
			• **FNN / SCORE** 6.8 MN	• **Disney Channel** (E) 5.8 & 6.8 MS	**Netcom** (O/V) 6.2 & 6.8 MN	4
	JISO / Brightstar (O/V) 6.2 & 6.8 MN			• **Showtime** (E) 6.8 MN	Occasional Video	5
			• **Satellite Program Net.** 6.8 MN / 5.58 & 5.76 DS	• **Spanish Internat'al Net.** 6.8 MN		6
oresight Techline days / 8 - 10 PM (ET)	**CBS** (Contract Channel) 6.2 & 6.8 MN		**ESPN** (Alternate Feed) 6.8 MN / 5.58 & 5.76 DS	• **CNN** 6.8 MN		7
	• **PASS** (Detroit) 6.8 MN	Occasional Video	• **CBN Cable Network** ■ 6.8 MN	**CNN Headline News** 6.8 MN	• **NBC** (Reg. Programs) 6.8 MN	8
Occasional Video			• **USA Network** 6.8 MN / 5.58 & 5.76 DS	• **ESPN** 6.8 MN / 5.58 & 5.76 DS	Occasional Video	9
			• **Showtime** (W) 6.8 MN	• **Movie Channel** (E) 5.8 & 6.8 MS		10
ital Satellite Network (Scrambled)	**Group W Satellite Comm.** (Occasional)		• **Music TV** 5.8 & 6.62 MS	• **CBN Cable Network** ■ 6.8 MN	**ABC** (London) 6.2 & 6.8 MN	11
			• **Eternal Word TV Net.** 6.8 MN	• **Home Team Sports** (Maryland - D. C.) - 6.8 MN	**FNN / Netcom** 6.2 & 6.8 MN	12
Occasional Video			• **HBO** (W) - 6.8 MN (Test Scrambling)	• **C - Span** ■ 6.8 MN	**Maryland Horse Racing** (Scrambled)	13
	Occasional Video			• **Movie Channel** (W) 5.8 & 6.8 MS		14
ACTS 6.8 MN	**TVSC** (Pittsburgh) (O/V) **Penn Racing** (Scrambled)		**Video Hits One (VH-1)** 6.8 MN / 7.4 Digital Stereo	• **WOR - TV** (New Jersey) 6.8 MN	Occasional Video	15
SIN 6.2 & 6.8 MN	**Group W Satellite Comm.** (Occasional)		• **HTN Plus** -6.8 MX • **Learning Chan.** -6.8 MN	**TMC Test Channel** (Scrambled)		16
			• **Lifetime** 6.8 MN	• **PTL Network** ■ 6.8 MN / 5.58 & 5.76 DS		17
Occasional Video	**TVSC** (Pittsburgh) (O/V) **Group W Satellite** (O/V)	**American Extasy** **FM America**	**Reuter's** (Digital Video) **National Jewish TV** -6.8 MN	• **WTBS** (Atlanta) 6.8 MN	**NASA** (Contract Ch.) 6.8 MN	18
			• **C-Span** ■ 6.8 MN	• **Cinemax** (E) - 6.8 MN (Test Scrambled)	**Digital Radio** (NY) (NBC,CBS,RKO)	19
Occasional Video	**TVSC** (Pittsburgh) (O/V) **Santa Anita Racing** (S)		• **Black Entertainment TV** 6.8 MN / 5.58 & 5.76 DS	• **Galavision** 6.8 MN		20
st TV Net. (Scrambled) erbilt Medical - 6.8 MN	• **FNN** (Alternate Feed) • **Sat. Forum** -Sun / 10 PM	**Telebet Pennsylvania** (Scrambled)	• **Weather Channel** 6.8 MN	**ESPN** (Promo) 6.8 MN		21
	Taft Broadcasting (O/V) **Meadows Racing** - 6.8 MN	• **KTVT** (Dallas - Ft. Worth) 6.8 MN	• **Home Shopping Network** • **Modern Satellite Network**	• **Discovery Channel** 6.8 MN	**HI-NET / Netcom** 6.2 & 6.8 MN	22
Occasional Video			• **Cinemax** (W) - 6.8 MN (Test Scrambling)	• **HBO** (E) - 6.8 MN (Test Scrambled)	**Digital Radio** (NY) (ABC)	23
	Taft Broadcasting (O/V) **Fantasy Channel / PPV** (S)		• **Arts & Entertainment** 6.8 MN / 5.58 & 5.76 DS	• **Disney Channel** (W) 5.8 & 6.8 MS	**Radio Televisione** **Italiana** - 6.8 MN	24

cing requirement.

*Vertical channels are 72 mhz bandwidth.

■ = Simulcast Services H = Horizontal V = Vertical (E) = East (W) = West (S) = Scrambled

—Special Sports Feeds—

D (Anik D) - 1,2,4,11,13,15,19,20
1 (Galaxy 1) - 3,9,12,15,18
2 (Galaxy 2) - 15,16,17,18
3 (Galaxy 3) - 2,4,6,8,9,11,12
1 (Satcom F1) - 5,8,9,11,18,20,24
2 (Satcom F2) - 5,20
3 (Satcom F3) - 7,9
4 (Satcom F4) - 1,5,6,9,11,13,14,18,19,20,21,22,24

S1 (Spacenet 1) - 7,9,13,19,23
T1 (Telstar 301) - 2,6,7,10,12,24
T2 (Telstar 302) - 10,15,16,17,19,23,24
T3 (Telstar 303) - 22
W2 (Westar 2) - 5,11,17,21
W3 (Westar 3) - 19,23
W4 (Westar 4) - 10,11,20
W5 (Westar 5) - 7,8,14,15,18,20,21,22,24

he Networks use Ku-band (12 GHz) and ground microwave relays for some transmissions.

KU-BAND

SBS 3 - 95°	Anik C2 - 112.5°	Anik C3 - 117.5°
1 Occasional Video	1 Occasional Video	3 Occasional Video
2 Videostar Conn.	2 Movietime(DBS)	8 Knowledge Net(W)
3 NBC(Pacific)	4 Showcase(DBS)	9 Alberta Access(W)
5 NBC(Occasional)	5 Occasional Video	12 Superchannel(W)
6 NBC(Central)	6 ESPN	18 Atlantic Sat Net(E)
7 Campus Sat. Net.	7 Music TV(DBS)	19 Premier Choix(E)
8 PSN(Scrambled)		24 La Sette(E)
9 NBC(News feeds)		26 TV Ontario(E)
10 Occasional Video		31 Superchannel(E)
	DBS = Pay TV Service	32 Radio Quebec(E)

Buyer's Guide cont. from page 64

This is one of the best ways you have of deciding between various systems.

Is there a manual (and perhaps even a troubleshooter's guide) provided with the system? It is important that you have one, even if you think you understand how to operate the system. If there is an owner's manual—examine it! Is it too technical for you to understand? Many reported that it was. If it is, then you need to ask your dealer about any sections that are unclear.

How will you know what programs are being shown on which satellite and when? Six percent of the owners responding to our survey want dealers to provide more information on the various satellite TV programming guides and where they can be obtained (they are different from regular or cable TV programming guides). Some owners feel that dealers should include a program guide subscription with every satellite system sale. Others feel that a dealer should at least provide a program guide for a few weeks until their own subscription becomes effective.

So it would seem that there is more to finding a good satellite dealer than simply thumbing through the yellow pages, making a few calls and then choosing the one who offers the best price. Instead, think about what other owners have learned, decide what is important to you, then keep looking until you find a dealer who meets your criteria. You'll be glad you did.

*All percentages are approximate

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Satellite Earth Station Day cont. from page 44

executive editor of Satellite Orbit; Terry Easton, eletronics writer and technical editor of TV Satellite VideoWorld; Blair Gilbert, editor and publisher of TVRO Technology; Mike Gustafson, technical editor of STV, and many others.

Some idea of the tremendous number of Capitol Hill influentials personally contacted during the day can be seen from the sandwich court. Nearly 1,000 sandwiches were consumed at SPACE's Russell Office Building hospitality suite. The 1,000 sandwiches at the Rayburn building were totally consumed and it became necessary to order 200 more.

During the call-in portion of the show, phone lines lit up throughout the evening, Behar says. The broadcast was promoted in part by verbally briefing the weekly satellite TV show guides. Additional promotion to satellite system owners was provided by Satellite Showtime, Boresight, and Satellite Forum.

The vastness of the entire undertaking was put into comic relief by a satellite TV trade magazine reporter on the scene. "Only the 'warped' mind of Bob Behar," he quipped in tones combining humor and awe, "could imagine that SPACE might possibly pull off such an extravaganza in only three weeks time. And you know what? He was right!"

Courtland G. Newton, Jr., is Vice President of Roher Public Relations Firm in New York.

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SCPC

Dear **STV**,

Would you please consider doing an extensive article on FM-SCPC reception.

The June issue of **Monitoring Times** includes an article on it which left me confused. It stated that 90% of receiver/downconverters probably cannot lock onto these narrow transmissions because they are designed for wider video transmissions.

When I first read **The Satellite TV Handbook** I was left with the impression that the baseband video output of any receiver with one would do the job.

Do you ever intend to issue an index covering all past issues? It would sure help in locating specific articles.

Sincerely,
Steven Garren
Winder, GA

*A good book we suggest to answer all your SCPC questions is **The Hidden Signals,** by Tom Harrington and Bob Cooper. Any receiver which has a baseband audio output will work This signal can be fed directly to the antenna terminals of a shortwave receiver that has continuous tuning from 4 to 8 MHz. Not all shortwave receivers have this capability, some tune only the ham bands. A detailed listing of the number and type of programming is available in Hidden Signals. A back issues index is included in this issue, page 68. An article on SCPC is scheduled for publication in the near future.*

Receiver Dilemma

Dear **STV**,

I have been an avid reader of STV Magazine for about eight months and have been particularly interested in your articles on "Product Reviews." I have decided to purchase a home satellite TV system but am having difficulty in selecting a receiver. After considering your articles carefully I have decided what I would like to have in my receiver.

(1) Synthesized receiver both video and audio.
(2) Direct channel access on both receiver and remote.
(3) Automatic polarization or programmable polarization.
(4) Stereo sound.
(5) Direct audio and video outputs.

My first choice was a GLR-868 and MDC 800 receiver and dish control by Automation Techniques, Inc., which has most of what I wanted in a system. However, after writing two letters to their address as listed in STV (1550 North 105th East Avenue, Tulsa, OK) requesting information about their products and receiving no reply at all, I am somewhat skeptical of their products. I would appreciate very much any comment you may have on the following synthesized receivers or any others that you consider good.

(1) Automation Techniques (868)
(2) M/A-Com H-1
(3) General Instrument System 1000
(4) Viewstar VSS 1450

In closing may I say that your articles in STV have been a big help in answering questions about home satellite television, and I look forward each month to your reviews.

Yours very truly,
Arnold A. Richardson
Huntington, WV

*Unfortunately two of the receivers are manufactured by companies that have internal problems. Automation Techniques is operating under Chapter 11 of the Bankruptcy Act and Viewstar has just announced that they are closing their satellite division. Obviously we cannot recommend buying receivers from these companies no matter how well they perform. You may wish to order the **Satellite TV Product Review Book** for $5.95 which includes extensive test reports on the most popular receivers including the M/A-Com HI & TI,*

Continued

DX is stereo.

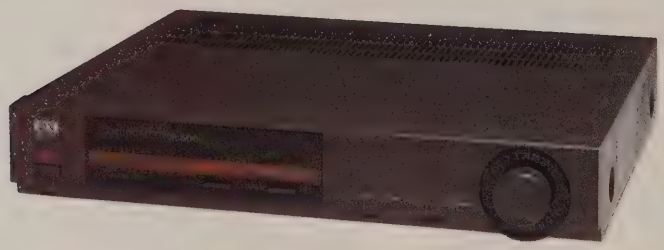
DX proudly introduces the DSB-700S Stereo Satellite Receiver with full-function remote control. It receives both C and Ku-band programs, comes descrambler ready, and it lets you select either discrete or matrix stereo sound, too. Plus, the picture-perfect quality that DX is famous for.

For complete information, contact your authorized DX dealer, or write: DX Communications, Inc., 10 Skyline Drive, Hawthorne, NY 10532.

The Quality Line.

DX ANTENNA

DX is budget priced.



DX has combined high performance with budget prices. Introducing the new DSB-500 Satellite Receiver. It features a convenient TV-type tuner and pushbutton control to deliver both C and Ku-band programs, and the DSB-500 is descrambler ready. All at a price that will amaze you.

For complete information, contact your authorized DX dealer, or write: DX Communications, Inc., 10 Skyline Drive, Hawthorne, NY 10532.

The Quality Line.

DX ANTENNA

Chaparral Sierra, US Maspro SR-3, Kenwood, and many others.

More Reviews

Dear **STV**,

I enjoy reading your magazine. It's about the best for all around information. We subscribe to STV at the shop, I subscribe to another at home and one of our customers gives me his third variety when outdated for viewing information. Keep up the good work at STV.

However, it puzzles me that you haven't been able to get a Birdview Spoon for review. We're halfway between Denver and Omaha, out in the sticks of Nebraska, and the Birdview dealer here has had a Spoon for at least two months! What's the lag time on your magazine?

Would you please do an article or series of articles on all of the various audio systems currently in use on satellite? I have been to the library and have been reading all of the satellite material I can get my hands on and I have not found any articles that explain satellite audio. I am an audio freak and

satellite TV/video is just some more frosting on the cake. And as an audio freak, I want to know why and how things work. A technical article please on matrix, multiplex, and Digital Dolby Stereo (Video Hits-1). Then there's those listings for Digital Radio in the guides also. Encode all the way through decode, please.

Another puzzlement for me is the audio frequency response you list in your test results. Is satellite audio really that bad or are you misreading (I hope not) your audio meters in the midst of all your video?

It would be of great interest to us as dealers as well as individuals if you would take the example of **Audio and Stereo Review** and review four to six different satellite receivers each month. I have been reading all of the new ads on the new Luxor, Chaparral, Panasonic, Aimer, etc. When do we get to know how well they work? At one receiver a month, maybe 13 months from now!

I didn't intend on writing a critical letter but it did kind of slant that way. Guess you're happy that I'm not unhappy with what you do — just that I wish you would do more!

Sincerely,
Eldon L. Andersen
Ogallala, NE

Birdview has discontinued the SPOON antenna reportedly because of production problems. The reports on audio performance are accurate. The problem is that the current receivers cannot cope well with the wide range of audio deviation used by the satellite programmers. There are no regulations governing deviation of audio subcarriers and the programmers are free to crank-up the audio to whatever level they desire. Some more thought must be put into the design of the audio circuitry to take advantage of the high quality audio available from the satellites. STV is continually updating the editorial content and we are trying to include more test reports per issue but we do require the space for other articles and departments. STV's Product Review Book might be the answer to your requirements.

Uplink/Downlink is devoted to letters from our readers. We welcome questions, comments or anything else you may feel is relevant. Send your letters to: **STV® Magazine, Uplink/Downlink, P.O. Box 2384, Shelby, NC 28151-2384.**

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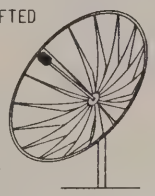

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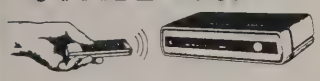

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For complete information, contact your authorized DX dealer, or write: DX Communications, Inc., 10 Skyline Drive, Hawthorne, NY 10532.

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DAVID OWEN-THE ATLANTIC (MONTHLY) JUNE 1985.

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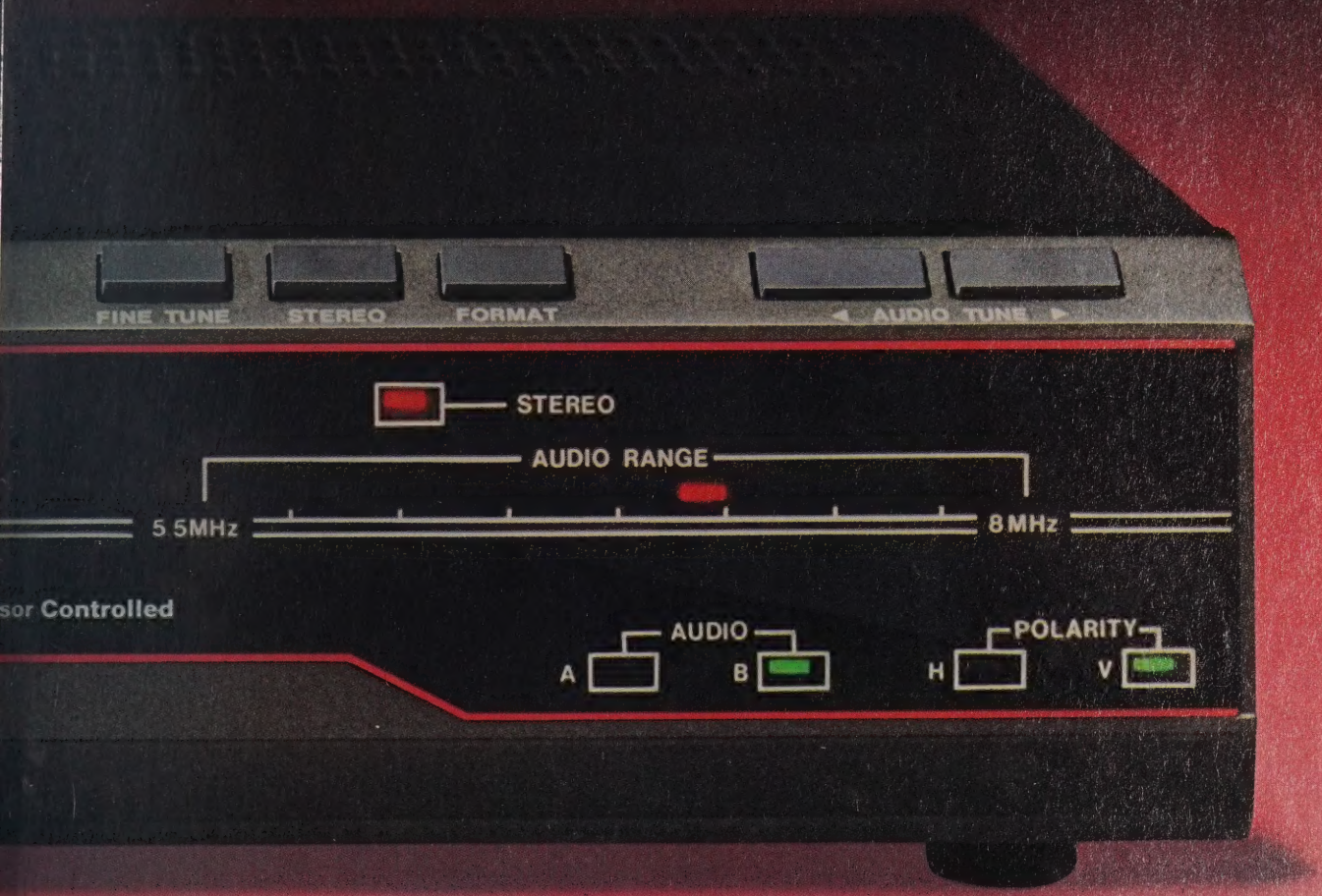

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